CENTRE CITY
TRANSPORTATION ACTION PROGRAM

FINAL REPORT
MAY 1985

Submitted to

METROPOLITAN TRANSIT DEVELOPMENT BOARD

CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
SAN DIEGO ASSOCIATION OF GOVERNMENTS
CENTRE CITY DEVELOPMENT CORPORATION
PRIVATE SECTOR

Prepared by

PRC ENGINEERING

The preparation of this report has been financed in part through a grant from the United States Department of Transportation, Urban Mass Transportation Administration under the Urban Mass Transportation Act of 1964, as amended, as passed through by the San Diego Association of Governments and, in part, by local funds from Centre City Development Corporation, City of San Diego, San Diego Association of Governments, Metropolitan Transit Development Board, Unified Port District, and Private Sector contributions.

ACKNOWLEDGEMENTS

PRC Engineering, the consultant retained for the Centre City Transportation Action Program, would like to thank the following people and agencies for their excellent cooperation and assistance during the study process.

Dennis Wahl	MTDB Project Manager

Technical Advisory Committee

Allen Holden, Jr.	City of San Diego Transportation and Traffic Engineering Division
Tim Price	San Diego Transit
Dorothy Migdal	Chamber of Commerce
Lee Hultgren	SANDAG
Roy Potter	San Diegans, Inc.
Fred Trull	Unified Port Distrct
Jaswant Kooner	County of San Diego
Max Schmidt	CCDC
Bill Lorenz	County of San Diego
Marianne Munsell	City of San Diego Planning Department
Mike Hix	SANDAG
John Fowler	Assistant City Manager
Carl West	Caltrans District 11
Dick Mattox	Caltrans District 11
Tom Larwin	MTDB
Bill Lieberman	MTDB
Dennis Wahl	MTDB

Centre City Advisory Committee on Transportation and Parking

William Nelson (Chairman)
John McNeese
Senator James R. Mills
Joyce Beers
Daniel Larsen
Bill Schempers
Mary Berglund
Peter Davis
Ronald Zappardino
Don Schoell

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF TABLES
(Continued)

LIST OF FIGURES

LIST OF FIGURES
(Continued)

EXECUTIVE SUMMARY

INTRODUCTION

The purpose of the Centre City Transportation Action Program Study is to analyze existing and future transportation conditions in Centre City, and to recommend a multi-modal action program for transportation improvements to serve increased travel demand that will occur in Centre City in relation to the increases in activities and densities projected to occur. The study was conducted in six tasks, with a number of technical memoranda produced during the study, and on-going coordination provided by monthly meetings with a Technical Advisory Committee and the Centre City Advisory Committee for Transportation and Parking. PRC Engineering, consultants in transportation planning and traffic engineering, conducted the study, under the project management of the Metropolitan Transit Development Board.

The Final Report contains five chapters. Chapter 1 describes existing transportation conditions; Chapter 2 covers the land use analysis conducted for the study; Chapter 3 reviews projected future transportation system deficiencies; Chapter 4 describes the analysis of alternative transportation solutions; and Chapter 5 presents the recommended Transportation Action Program. The main highlights of the study are presented below:

EXISTING CONDITIONS

The study area for the Centre City Transportation Action Program extends from San Diego Bay to the I-5 Freeway, to Laurel Street in the north, and to Commercial Street in the south. Based on an analysis of a wide range of relevant data, the key conclusions regarding current conditions are the following:

- A total of 286,000 vehicle trips cross the Centre City cordon into downtown every day. With an average vehicle occupancy of 1.38, automobile person trips across the cordon total about 389,000 daily. There are a further 57,000 daily passenger trips by transit across the cordon. Therefore, a total of approximately 446,000 person trips cross the cordon into Centre City each day, of which 12.5 percent are by transit. While virtually all of the auto trips are actually destined for Centre City, many of the transit trips are trips passing through downtown, either on direct transit service or transferring between bus routes. Best available estimates indicate that 5-8 percent of trips destined to downtown on a daily basis use transit.

- Many of the key freeway ramps, primarily those to I-5 between Front and Sixth Avenues, the SR-163 and SR-94 ramps, are currently operating close to or at capacity during the peak period. Of the 23 freeway ramps serving Centre City, 10 ramps carry 70 percent of the total traffic volume. There is a lack of direct freeway access to the west side of Centre City.

- There are 35 surface streets providing access to Centre City, although 80 percent of traffic volumes are accounted for by only 18 of these streets.

- On the major roadways in/out of Centre City, traffic volumes are currently on average at about 60 percent of roadway capacity. Volumes are closer to capacity on streets in the north of Centre City than streets in the east. On the eastern cordon there is rather more surplus capacity, with traffic volumes on major streets (C, G, Broadway, Market) in the range of 30-55 percent of capacity.

- An analysis of volume/capacity conditions and travel speeds within Centre City indicates generally low levels of traffic congestion on Centre City roadways. Traffic volumes in general are below roadway capacities and traffic congestion is limited to a few localized areas, such as First and Fifth Avenues, both of which access I-5.

- There is a significant level of transit usage both to and through Centre City. A high volume of transit transfers occurs in downtown, due largely to the radial nature of the bus system.

- Traffic conflicts are most numerous on Broadway due to the high traffic volumes, since it is a major focus for bus routes through Centre City, as well as an area of high pedestrian activity. The heaviest conflicts are where Broadway crosses the major north-south travel corridor of Fourth, Fifth, and Sixth Avenues, and in the area of Third Avenue adjacent to the Horton Plaza.

- The limited number of streets connecting across Centre City has the effect of focusing traffic into a few principal travel corridors. Route choices are generally restricted.The discontinuity of a number of east-west streets (B, E, F Streets) in Centre City does not currently present major congestion problems probably because of the lack of a current major demand for east-west travel west of First Avenue. This may become a more significant problem in the future as land use density increases west of Front/First Avenue.

- Transit routing options through Centre City are limited, due primarily to the extensive one-way street patterns, the high number of closed (discontinuous) streets, and severe grades in the northeast quadrant of Centre City.

- There are currently 40,200 parking spaces in Centre City, of which 10,400 are on-street and 29,800 are off-street. The analysis indicated that there is some current spare parking capacity, although in general the parking supply is close to being fully utilized, particularly in the Central Area.

LAND USE ANALYSIS

As part of the task of analyzing existing conditions, a land use inventory data base was developed on a block-by-block basis for Centre City. In the preparation of the

inventory, land use amounts were defined by a number of key land use types, for each block in the downtown. The number of employees and residents in downtown were then estimated through the application of employee density and household size factors.

Three alternative future development levels were identified for Centre City for use in the evaluation of future transportation needs, as follows:

- Level 1 - Existing Plus Committed Projects
- Level 2 - Optimum Employment Land Use
- Level 3 - Optimum Residential Land Use

These three scenarios were identified as representing a significant range of potential development scenarios. The Level 1 scenario relates to a mid-range projection primarily based upon known and committed projects. Hence, it is highly probable that Level 1 development will be reached. The Level 2 and Level 3 scenarios relate to a longer range time horizon; therefore, they are more speculative. Level 2 comprised optimistic assumptions regarding employment growth in Centre City. Level 3 assumed less employment growth and comprised a maximum residential growth scenario.

It should be noted that the land use levels assumed for the analysis of potential future transportation system deficiencies are not official forecasts but a range of scenarios defined for the purposes of testing.

Table A summarizes the key parameters of the existing conditions and each of the three land use scenarios assumed for the travel forecasts. For the Level 1 Scenario (Existing Plus Committed), building space in Centre City would increase from today's level of about 21.7 million GSF (gross square feet) to almost 28 million GSF, with the number of employees working in Centre City increasing by about 40 percent from 67,800 to 94,300.

TABLE A. SUMMARY OF FUTURE DEVELOPMENT LEVEL ASSUMPTIONS

Scenario	GSF	Employees	DU's	Population
Existing	21,715,000	67,800	4,150	6,250
Level 1	27,770,000	94,300 (+39%)	6,200	9,300 (+49%)
Level 2	34,522,000	131,500 (+94%)	7,450	11,200 (+79%)
Level 3	32,160,800	117,300 (+73%)	9,150	13,750 (+120%)

Note: 1. GSF = gross square feet.
2. Figures in parentheses show percent increase over existing case.

Under the Level 2 Scenario (Optimum Employment), downtown building space would increase to about 34.5 million GSF, and downtown employment would increase by 95 percent over today's levels to about 132,000 employees. The Level 3 Scenario (Optimum Residential) defines lower development than Level 2, with about 32.2 million GSF of building space and 117,000 employees. This scenario also defines a 120 percent increase in residential population in Centre City, from 6,250 persons today, up to almost 14,000 persons in the future.

The main areas of employment growth are projected to be in the existing core area and in the area to the west of the existing core bounded by Ash, State, Market and Harbor Drive. Principal areas of population growth are projected to be in the waterfront areas west and south of the existing core, as well as to the north of Ash. Very little growth activity is projected to occur in the eastern part of Centre City in any of the three development levels.

ANALYSIS OF FUTURE DEFICIENCIES

The projected growth in travel activity associated with Centre City is summarized in Table B. The table shows trip ends in Centre City for the Existing, Level 1, 2 and 3 cases, for auto driver, auto passenger and transit passenger modes. Overall, travel activity associated with Centre City is projected to increase by about 45 percent for Level 1, by almost 100 percent for Level 2, and by about 80 percent for Level 3. In the "worst case," the Level 2 forecast, total trip ends in Centre City would increase from today's total of 402,000 to a future total of 803,000 (person) trip ends.

TABLE B. CENTRE CITY TRAVEL FORECAST TOTALS

	Centre City Trip Ends			
Mode	Existing	Level 1	Level 2	Level 3
Auto Driver	274,850 68%	387,545 67%	504,835 63%	457,195 63%
Auto Passenger	102,620 25%	145,860 25%	199,125 25%	180,075 25%
Transit Passenger	25,000 7%	47,400 8%	99,400 12%	90,800 12%
TOTAL	402,500 100%	580,800 100%	803,400 100%	728,100 100%
Growth		+44%	+97%	+79%
Vehicle Occupancy		1.38	1.39	1.39

While the number of auto driver trip ends is forecast to almost double between existing and Level 2 conditions, transit trips are projected to increase by almost four times for the Level 2 scenario. The existing mode split of 7 percent of all

trips by transit is projected to increase to about 8 percent for Level 1 and 12 percent for Levels 2 and 3. This is largely reflective of the extended transit system assumed to be in place by the year 2005.

The key conclusions from an analysis of future transportation system deficiencies that would occur as a result of the projected land use changes, are summarized as follows:

- For Level 1, the key freeway capacity problems would occur on SR-163. Overloads would also occur, but to a lesser degree, on SR-94 and I-5 north of Centre City. For Level 2, SR-163 is projected to be significantly over-capacity, as are I-5 north of Centre City, and SR-94. In the immediate vicinity of Centre City, I-5 would operate close to or at capacity.

- The key capacity deficiencies for freeway ramps under the Level 2 and 3 scenarios, during the evening peak period, would be I-5 NB at Elm, and SR 163 NB at Eleventh.

- Within Centre City, capacity shortfalls would be most pronounced in the "core" area west of Sixth Avenue, due to the primary development locations assumed for Centre City. The lack of direct connections from I-5 to the west side of Centre City would effectively funnel traffic across the northern cordon between Front and Sixth Avenues. Key streets would operate either below, or close to, capacity. By Level 2, however, many major streets would be at or over-capacity.

- As access routes to I-5 in the north of Centre City become congested, traffic from the east will increasingly travel across Centre City to destinations in the west of downtown. This is reflected in the high volumes and capacity deficiencies forecast for Broadway.

- Both transit service capacity and transit passenger volumes will increase significantly under all development scenarios tested. Key problem areas for transit will be bus-auto conflicts on streets carrying transit routes, such as Broadway and the Front/First couplet, and LRT-auto conflicts in planned trolley corridors such as for the North Line (Pacific Highway/Kettner Boulevard), and Bayside (Harbor Drive). Bus transit service will also be affected by the freeway ramp capacity deficiencies identified earlier.

- The development scenarios assumed would all extend the primary area of pedestrian circulation and lead to significant increases in pedestrian volumes. Assumed development patterns would lead to increased east-west flows between the financial core, Columbia district, and the waterfront, with potential pedestrian-auto conflicts with the Front/First couplet, and Pacific Highway corridors.

- Significantly increased pedestrian flows may also be expected across Broadway, particularly related to Horton Plaza, as well as further

south to the Convention Center and other developments along the southern waterfront. Current access is very limited for the latter demand pattern.

ALTERNATIVES ANALYSIS

Based on the analysis of future system deficiencies, four alternative transportation solution packages were developed, tested and evaluated. The four action packages were analyzed with respect to traffic forecasts for the Level 2 development scenario. Level 2 represents the highest development potential for the year 2005, and thus the "worst case" scenario in terms of travel demand. Some of the measures evaluated would thus only be necessary or appropriate in the longer term, or not at all if Level 2 development were not achieved.

The emphasis of each action package varies, in terms of cost to implement, policy ramifications, feasibility, and whether the primary focus was upon increasing transportation supply or reducing travel demand. The packages may be summarized as follows:

- Package I emphasized optimization of efficiency of the current system through various traffic management treatments, and capacity expansion through on-street parking management.

- Package II was largely demand-management oriented, and focused upon the potential for pooling and ridesharing, work schedules, road pricing and related strategies, and non-vehicular modes (pedestrian, bicycle), to reduce the level of transportation demand.

- Package III emphasized transit and off-street parking management strategies, mostly to control demand but also for augmenting transit capacity.

- Package IV was heavily oriented towards increasing system capacity, including freeway/ramp capacity enhancements, major street system widenings and extensions, and transit service expansions.

The packages thus covered a considerable range of transportation solutions ranging from low-cost simple measures in Package I to higher-cost capital measures in Package IV. A wide variety of action types, component elements and policy-related strategies were examined in testing and analyzing Packages I-IV. The results and conclusions were reviewed with both study advisory committees. No single package or type of action was found capable of mitigating all problems identified for Level 2. A combination of improvements, drawing upon all four packages, was developed for the Centre City Transportation Action Program.

TRANSPORTATION ACTION PROGRAM

Based on the foregoing alternatives analysis, a Transportation Action Program was developed for Centre City. The program was developed to be responsive to the following overall goal: "To provide and maintain a transportation system that ensures adequate access to, and mobility within, Centre City by all transportation modes (vehicular and nonvehicular), and that is supportive of the growing

importance and vitality of Centre City's role in the San Diego region as a business, commercial and recreational area."

As an integral part of the Transportation Action Program, the following policy guidelines are recommended as an overall structure for the individual program elements.

- Pursue a commitment to a multi-modal transportation system that recognizes the need for maintaining access to and within Centre City for auto, LRT, bus, rideshare, bicycle and pedestrian modes.

- Recognize the key importance of both automobile and transit system capacity in providing access to, and maintaining the economic viability, of Centre City.

- Implement a program that aims to maximize efficient use of the capacity offered by the various modal systems by minimizing the conflicts between them.

- Provide for automobile access by re-defining the preferred street systems in Centre City, and establishing major and collector streets designations for the purposes of focusing traffic flow into defined corridors such that other modes may more effectively utilize other corridors.

- Recognize the fundamental importance of Centre City roadways to the efficient circulation of all modes including transit and walk/bicycle; to prohibit closure of streets on the preferred street, transit and walk/bicycle systems north of Market Street, and to only consider street closures on these systems south of Market following comprehensive study of impacts and alternatives, and the demonstration of significant and overriding benefits to other Centre City goals/policies.

- Provide for transit access to and within Centre City by defining a preferred transit network to ensure efficient operation and routing of LRT and buses, and to define major bus streets to and bus travel through downtown and transfer activity within Centre City, and minimize conflicts with autos.

- Provide for pedestrian and bicycle movement by defining an identifiable and recognizable network through signing, striping, and special sidewalk treatments; that orients pedestrian and bicycle movements away from major streets while linking together key areas and land uses within Centre City.

- To encourage the use of transit modes and the use of ridesharing modes to provide alternate travel modes and a balanced transportation access system; and through a centralized office to actively support, pursue, and monitor transportation system management strategies.

- Control parking garage access such that garage ramps or entrances/exits are not placed on major bus streets, or streets on the pedestrian/bicycle system; and such that garage ramps do not encroach within the standard 52 foot cross section of Centre City streets.

- Encourage the conversion/provision of proportions of core area parking spaces for rideshare use potentially with reduced parking rates, to support Centre City rideshare program. Also encourage parking provision in identified focused peripheral parking areas outside the main core.

- Work toward a long-term parking management plan for Centre City and the core area in particular, that establishes policy guidelines and specific measures, to provide adequate parking while encouraging use of rideshare programs and transit through incentives.

- Recognize the need for integration of supportive actions/strategies in planning for downtown transportation, particularly the need for transit, rideshare and parking programs to be complimentary and mutually supportive.

- Re-define Centre City's role in the San Diego urbanized area, and recognize Centre City as a legitimate competitor for Citywide and regional funding programs; and to pursue all funding options, both public and private, as means for financing Centre City improvements.

- Recognize the need to implement the action program involves cooperation of numerous public agencies, and consider the potential need for modifications to the existing institutional infrastructure to expedite the action program.

Table C lists the individual actions and projects that are recommended in the Action Program. It also includes a Phasing Plan, by five-year intervals. The Level 1 scenario falls about at the end of the 1985-90 period, maybe extending a little into 1990-95, while the Level 2 scenario extends out to 2000 or 2005. The final element of Table C indicates the responsible agencies for each improvement. Figure A illustrates the recommended Preferred Street System, Figure B the Preferred Transit Network, and Figure C the Bicycle/Pedestrian Network. The following are key elements of the Plan.

Street System

It is recommended that the preferred street system in Centre City be revised to include major streets and collector streets. The major street system comprises those streets designated for principal traffic routes and freeway access corridors. Peak period parking and loading restrictions would be applied to these streets, as well as design guidelines for parking garage access. The collector street system is oriented more specifically for local access and circulation. Both major and collector streets are vital components of the overall preferred street system.

The improvements identified for the Centre City circulation system are intended to provide additional arterial entry corridors into Centre City (e.g. Kettner/India,

TABLE C. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS

I. STREET SYSTEM

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Revise Preferred Street System	1. Establish Major Street System	(See Figure 23	X				City SD
	2. Establish Collector Street System	(					
B. Re-configure and Re-stripe 1-way[1] Streets on Major Street System	1. Remove parking one-side						
	2. Re-stripe for 4-lane section (three moving and one parking)	(1-way streets on major street system, as necessary	X	X	X	X	City SD
	3. Prohibit peak period parking and loading[2]	(					
C. Re-configure and Re-stripe 2-way Streets on Major Street System	1. Remove parking both sides	(Broadway (Harbor - Pacific)		X			City SD
		(Ash (Harbor - Kettner)		X			City SD
	2. Re-stripe for 3L westbound and 2L eastbound	Market Street (Pacific - I-5)		X			City SD
D. Upgrade Street to Major Street Configuration	1. Change direction of traffic flow from existing preferred street system	G Street 1-way eastbound (Pacific Hwy - Fourth)		X			City SD
		B Street 1-way westbound[3] (First - Kettner)			X		City SD
	2. Minor re-construction, remove stop signs and add signals	Imperial Avenue[4] (Seventh - I-5)	X				City SD
E. Street Widening (reconstruction)	1. Widen from 4L to 6L	Harbor Drive[5] (Kettner-Seventh)		X			City SD
		Laurel St. (Harbor - Pacific)		X			City SD

(Continued . . .)

TABLE C. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

I. STREET SYSTEM

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
F. New Street Construction	1. B Street through City Concourse[6]	First - Third			X		City SD
	2. Connect Front Street to First Avenue at Island	Front/First/Island		X			City SD
	3. Connect First Avenue to Harbor Drive[7]	First/Harbor		X			City SD/ Santa Fe
	4. Connect Imperial Avenue to Harbor Boulevard at Seventh (close Eighth Avenue crossing)[8]	Imperial/Seventh/Harbor	X				City SD/ Santa Fe
G. Improve Freeway Ramps	1. Widen ramp	I-5 SB off-ramps at Front Street and Kettner[9]		X			Caltrans
		I-5 NB on-ramp at First Avenue[9]		X			Caltrans
		SR-163 on-ramp at and Eleventh[10]		X			Caltrans
	2. Re-sign and improve access.	I-5 SB Crosby Street ramps to/from Imperial.[11]	X				Caltrans/ City SD

(Continued . . .)

TABLE C. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

II. CENTRE CITY ENTRY CORRIDORS

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Implement Centre City Signing Program on Freeway Approaches	1. Sign financial district and waterfront traffic via Kettner/India and Pacific Highway	I-5/I-8/Pacific Hwy[12/]				X	Caltrans/City SD
		I-5/Washington[13/]		X			Caltrans/City SD
	2. Sign financial district,[14/] waterfront, and Convention Center traffic via Market Street and Imperial Avenue	I-5/Crosby/Imperial	X				Caltrans/City SD
B. Improve Freeway Capacity	1. Add auxiliary lanes (one lane[15/] each direction)	I-5 (I-8 - Front/First)	X				Caltrans
	Add auxiliary lanes (one lane each direction or implement reversible lanes)	SR-94 (I-5 - I-805)			X		Caltrans
	2. Add new lanes (one lane each[16/] direction with possible HOV treatment)	SR-163 (I-5 - University)		X			Caltrans
C. Upgrade Pacific Highway as Major NW Entry to Central City	1. Conduct detailed study of I-5/Pacific Highway Corridor		X				City SD/Caltrans
	2. Consider direct connection between I-5 and Pacific Hwy	I-5/I-8 interchange				X	City SD/Caltrans
	3. Study rear access to airport from Washington, to relieve Pacific Hwy		X				Port District/ SANDAG/MTDB/ Caltrans/City SD
	4. Consider Pacific Hwy upgrade to 8L	Barnett - Washington or I-5 ramps (depending on airport access options)				X	City SD

(Continued . . .)

TABLE C. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

III. PARKING

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Restrict On-street Parking on Major Street System and Major Bus Streets	1. Remove parking on one side of one-way streets, and both sides of two-way streets	All streets on major street system and major bus streets	X	X	X	X	City SD
	2. Prohibit peak period parking on major streets	(see Figures 23 and 26)	X	X	X	X	City SD
B. Control Parking Garage Access To/From Major Street System	1. Discourage parking access/egress via bus & pedestrian street system	Streets on pedestrian street system and major bus streets	X	X	X	X	City SD/CCDC
	2. Prohibit future parking garage ramp access from taking a lane in curb-curb roadway section; ensure future ramps merge into roadway section and preserve roadway capacity.		X				City SD/CCDC
C. Focus Parking Supply Additions Outside Core Area Into Preferred Peripheral Parking Zones	1. Establish preferred peripheral parking zones	Railroad/Laurel/I-5/Date	X				City SD/CCDC
		A/Twelfth/Broadway/Ninth	X				City SD/CCDC
		F/14th/Commercial/Ninth	X				City SD/CCDC
D. Provide HOV Priority Parking[17]	1. Encourage proportion of new parking spaces to be designated for HOV use	Within core area (Pacific Ash/Sixth/Market)	X	X	X	X	City SD/CCDC
	2. Encourage conversion of proportion existing spaces for HOV use		X	X	X	X	City SD/CCDC
E. Work Toward Long-Term Parking Management Program for Centre City	1. Develop policy for long-term and short-term parking. Review need for, and type of, controls. Finalize program.	Centre City/Core Area	X				City SD/CDC SD Transit/MTDB/ Chamber of Commerce
	2. Implement program.	Centre City/Core Area		X	X	X	City SD/CCDC

(Continued . . .)

TABLE C. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

IV. TRANSIT

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Designate Preferred Bus Network	1. Establish Bus Street Network	See Figure 26	X				City SD/SD Transit/ MTDB
	2. Establish Major Bus Streets	See Figure 26	X				City SD/SD Transit/ MTDB
B. Establish Broadway/E as Major Bus Streets	1. Continue routing eastbound buses on Broadway	Fifth Avenue - 16th Street	X				SD Transit/City SD/ MTDB
	2. Route westbound buses via E Street on contra flow bus lanes, connecting to Broadway at Fifth	Fifth Avenue - 16th Street	X				SD Transit/City SD/ MTDB
C. Establish Fifth/Sixth Avenues as Major Bus Streets	1. Focus north-south routes onto Fifth/ Sixth Avenues	Ash Street - Market Street	X				SD Transit/City SD/ MTDB
	2. Bus lane on Sixth Avenue	Ash Street - Market Street	X				SD Transit/City SD/ MTDB
D. Establish Columbia/ State Streets as Major Bus Streets	1. Focus routes onto Columbia/State Streets	Ash Street - Broadway		X	X		SD Transit/City SD/ MTDB
	2. Remove parking and widen sidewalks	Ash Street - Broadway		X	X		City SD/SD Transit/ MTDB
E. Focus Transit Transfers	1. Establish two key bus transfer nodes	Block of Columbia/C Street/ State/Broadway		X	X		SD Transit/City SD/ MTDB
	2. Relocate stops to transfer nodes where necessary						
	3. Encourage passengers to transfer at key nodes	Block of Fifth/Broadway/ Sixth/E Street	X				SD Transit/City SD/ MTDB
F. Light Rail Development Plan	1. Regional LRT routes outlined in RTP (1984).	East Urban Line	X				
		Point Loma Line		X			
		Mission Valley Line		X			MTDB
		Oceanside/Escondido			X	X	

(Continued . . .)

TABLE C. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

V. OTHER MODES

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Establish Pedestrian Route System in Centre City	1. Designate pedestrian routes (comprising key streets, as well as certain mid-block routes)		X				City SD/CCDC
	2. Where possible, widen sidewalks and/or establish special sidewalk/ paving treatments	See Figure 27	X	X	X	X	City SD/CCDC
	3. Implement signing/routing programs to assist in identification and use of pedestrian network		X	X			City SD/CCDC
B. Establish a Funded/ Centralized TSM Office to Coordinate TSM and Promotion in Public and Private Sectors	1. Office would coordinate all TSM and promotion, including: o Rideshare matching o Rideshare promotion o HOV priority programs o Variable work hours Office would be responsible for promotion and initial contacts/ coordination with new downtown developments	Areawide for Centre City - focus on core area (Pacific/ Ash/Sixth/Market)	X	X	X	X	Chamber Commerce/ CCDC/City SD

NOTES:

1/ Should be implemented incrementally, as necessary. Early priority should focus on northside, and I-5 access corridors, as well as Ash, A, F and G Streets.

2/ Requires simultaneous development and implementation of enforcement and tow-away program.

3/ In conjunction with Item I.F.1.

4/ In conjunction with Items I.F.4, I.G.2, and II.A.2.

5/ In conjunction with Items I.F.2, and I.F.3.

6/ Or earlier if City Concourse redeveloped and B Street project can be implemented at same time. Also in conjunction with Item I.D.1.

7/ In conjunction with Item I.E.1.

8/ In conjunction with Items I.D.2, I.G.2, and II.A.2.

9/ In conjunction with Item II.B.1, or otherwise not effective measure.

10/ In conjunction with Item II.B.2, or otherwise not effective measure.

11/ In conjunction with Item I.D.2, I.F.4, and II.A.2.

12/ Only effective if Items II.C.1-4 are implemented.

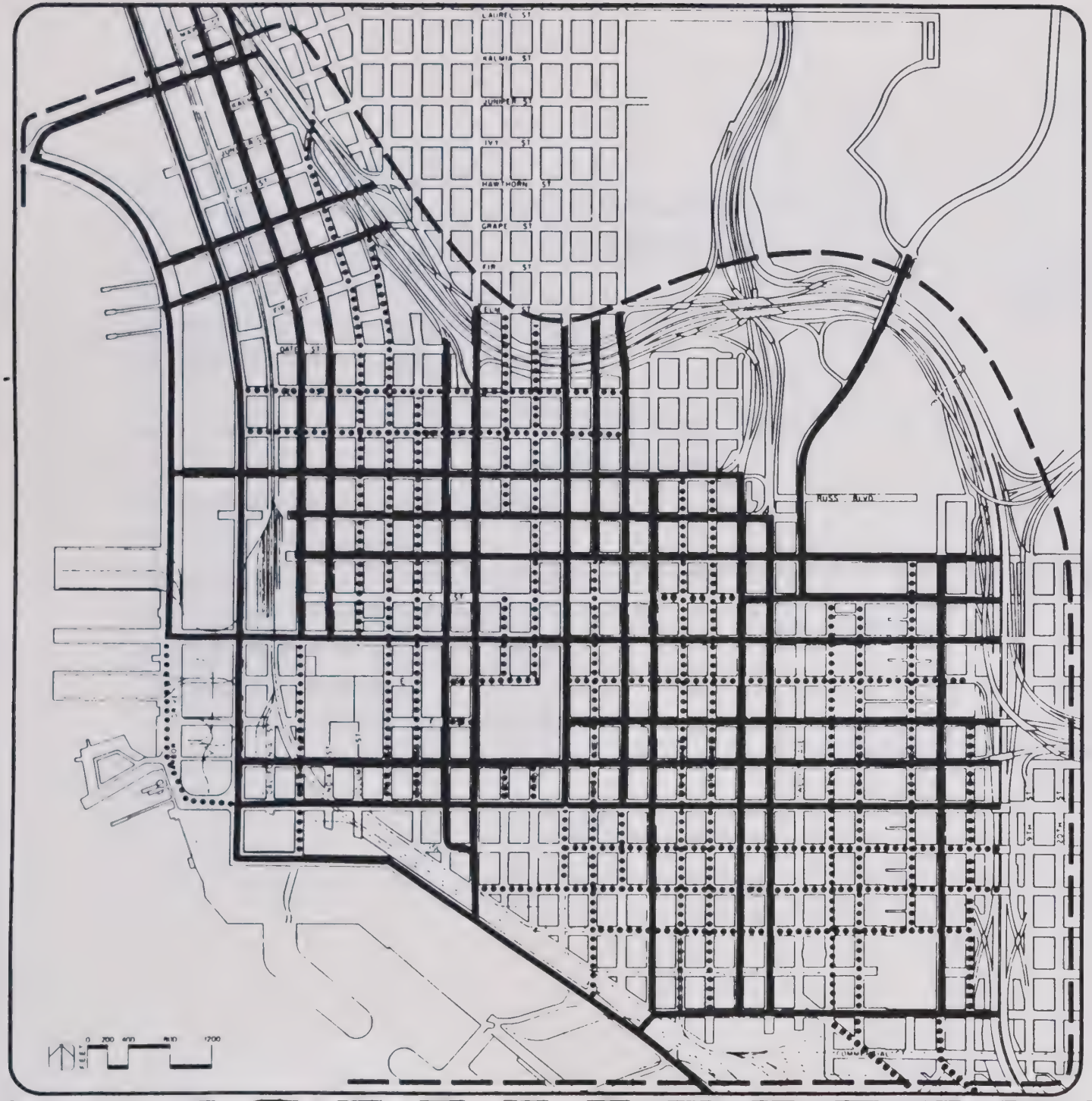
13/ Only effective if Kettner/India couplet upgraded to major streets.

14/ In conjunction with Items I.D.2, I.F.4, I.G.2.

15/ Programmed in STIP for FY87. Needs to be implemented before Item I.G.1.

16/ Needs to be implemented before Item I.G.1 (SR-163 ramp movements).

17/ In conjunction with Items III.C.1 and V.B.1.



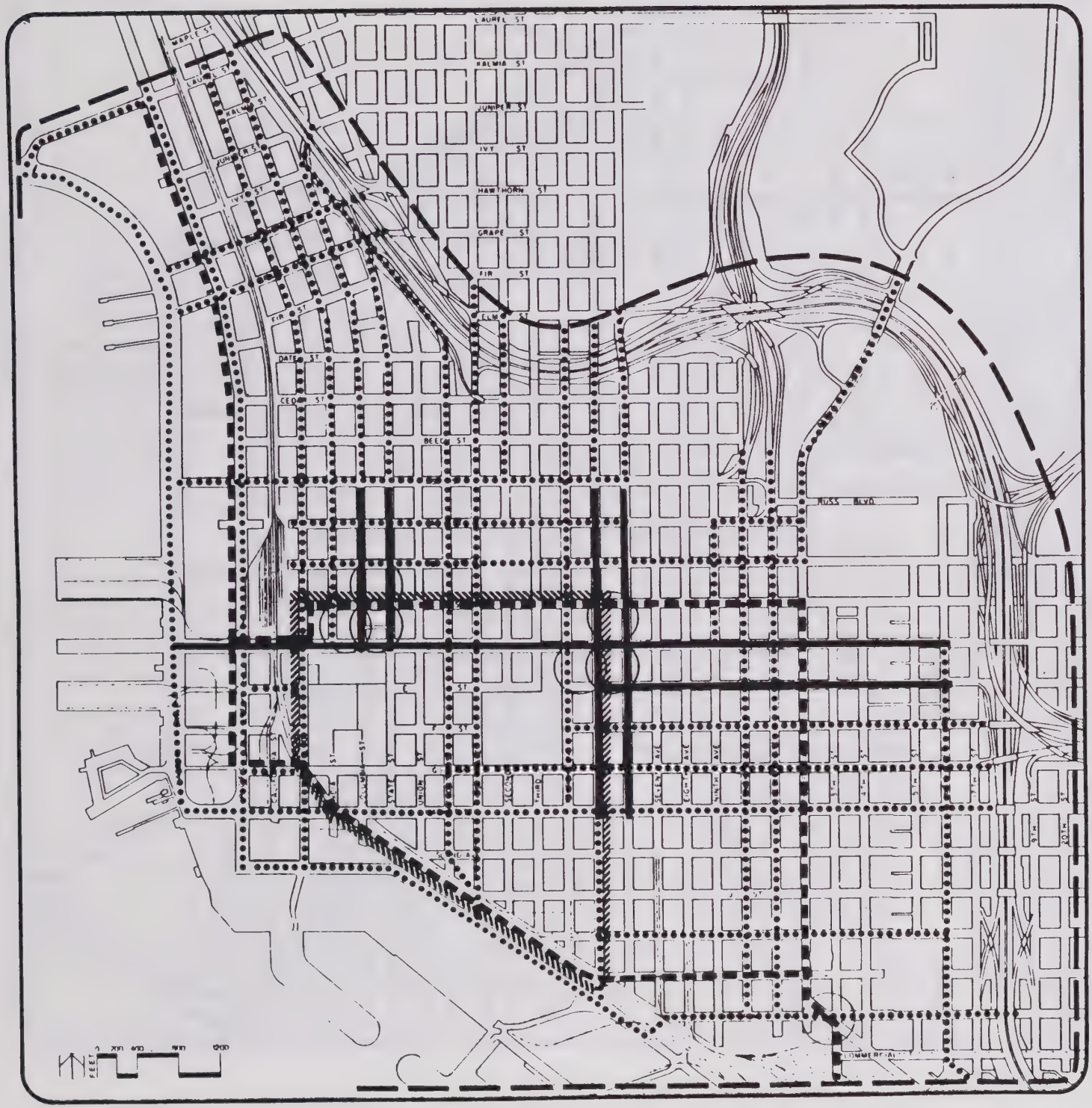
CENTRE CITY
Transportation Action Program

Legend:

- STUDY AREA BOUNDARY
- MAJOR STREETS
- COLLECTOR STREETS

FIGURE A
RECOMMENDED CENTRE CITY PREFERRED STREET SYSTEM

prc
PRC Engineering, Inc.



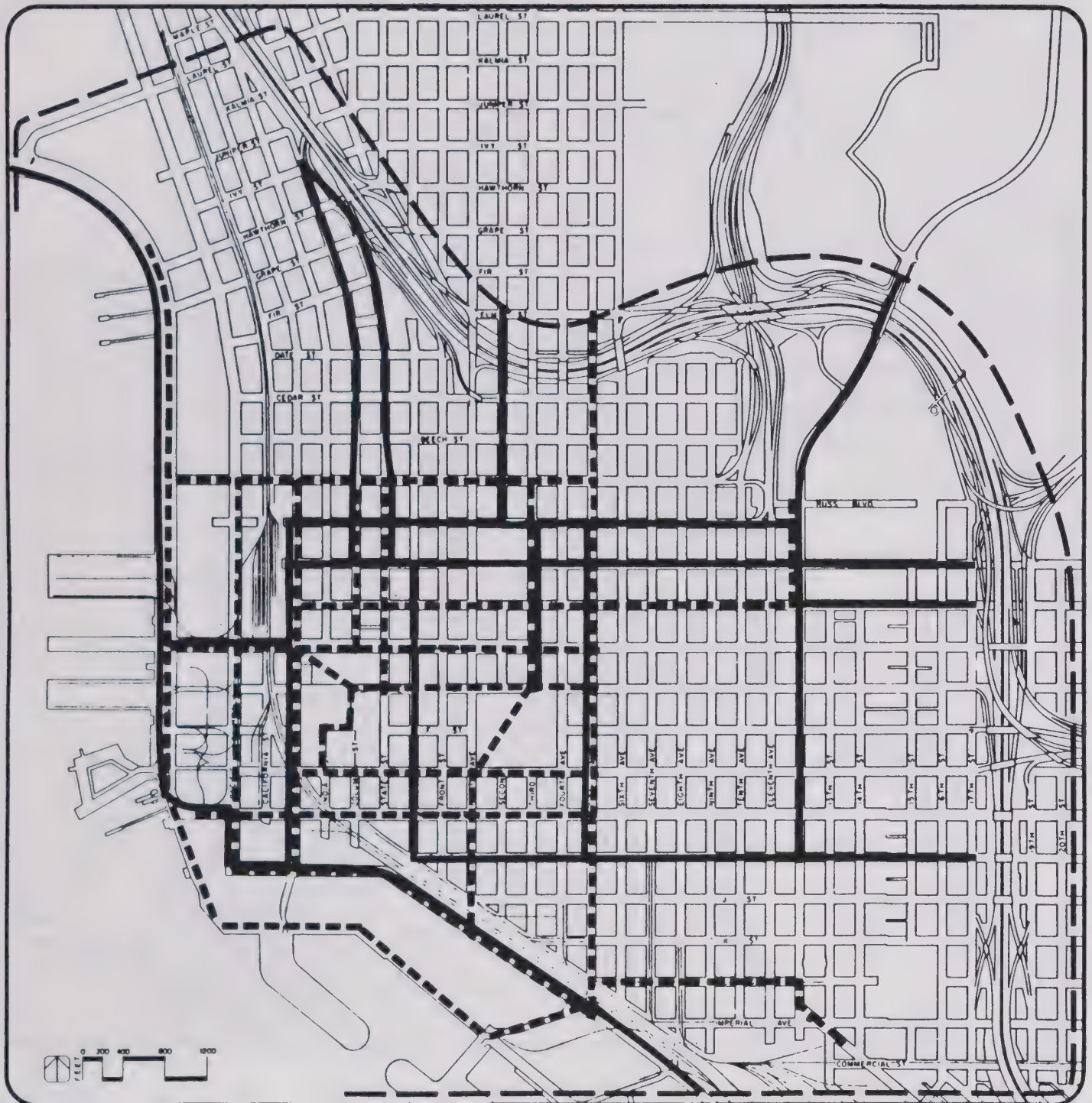
CENTRE CITY
Transportation Action Program

Legend:

- STUDY AREA BOUNDARY
- MAJOR BUS STREET
- BUS ROUTE STREET
- TRANSFER FOCUS
- LRT ROUTE
- GASLAMP TROLLEY

FIGURE B
RECOMMENDED CENTRE CITY PREFERRED TRANSIT NETWORK

prc
PRC Engineering, Inc.



CENTRE CITY
Transportation Action Program

Legend:

- STUDY AREA BOUNDARY
- PEDESTRIAN ROUTES
- BICYCLE ROUTES

FIGURE C
RECOMMENDED CENTRE CITY PEDESTRIAN AND BICYCLE NETWORK

prc
PRC Engineering, Inc.

Imperial Avenue) in order to more evenly distribute traffic flows, as well as to improve circulation both around and within Centre City. Peak period parking restrictions on the major streets of the preferred street system offers an effective method of significantly increasing capacity during the peak periods when it is most required. Street upgrade projects such as G Street, Imperial Avenue and Seventh Avenue, along with the new street connections for B Street, First Avenue to Harbor, and Imperial Avenue to Harbor, will also provide for a more balanced street pattern, offering a wider choice of travel routes into and within Centre City, and thus providing key relief to the projected eastwest capacity deficiencies.

Table C also itemizes recommendations for Centre City entry corridors. A signing program is recommended for I-5, to define key sub-areas of Centre City (such as Financial District, Columbia District, Waterfront, Convention Center), and to provide freeway signing specifically to those areas rather than the current general signing which tends to focus traffic onto the Front/First and Fourth/Fifth ramps. Improvements to the I-5 Front/First ramps are also recommended. Additional lanes are recommended on the I-5 (north), SR-163 and SR-94 freeway approaches to Center City. Concepts of reversible lanes on SR-94, and HOV lanes on SR-163 should be pursued for these additional lanes.

Parking

Recommendations for parking are summarized in Table C also. For those roadways designated major streets, restriping to four lanes will require the removal of parking on one side, and peak-period parking and loading restrictions on the other side. The establishment of peripheral parking zones is recommended, in order to focus additional parking provision outside the core area into specific areas, and to orient those areas for close freeway access thus limiting impacts on Center City streets. It is recommended that the various agencies work toward a long-term parking management program for Centre City. The goal of the program would be the adequate supply of short-term parking, and an evaluation of the need and type of measures for the provision of long-term parking in the core area.

Transit

A Preferred Bus Network is recommended (Figure B), identifying streets that are important for bus use. The Preferred Bus Network comprises streets that carry bus routes within Centre City, and is based on existing route patterns as well as anticipated future routing needs. The definition of this network is important to preserve streets for bus routings. Certain streets in the preferred Bus Network are identified as major bus streets. These are streets where the heaviest bus route activity is expected to be focused, and where conflicts with autos should be minimized. Wherever possible, the Major Bus Streets are lower volume streets that offer the potential for bus lanes and sidewalk widening/improvements. The Major Bus Streets are thus designed to expedite bus passage through Centre City. The plan also recommends focusing transfer activity into three key areas, shown in Figure B, in anticipation with the Preferred Transit Network.

The proposed San Diego Trolley alignments are also shown in Figure B, along with the Gaslamp Trolley alignment.

Other

The recommended Pedestrian and Bicyle Network (Figure C) establishes pedestrian and bicycle routes through Centre City that link together major activity areas and orient pedestrian traffic away from the major street system and onto collector streets or bus/transit streets, where improved pedestrian facilities can best be accommodated. In addition, a funded, centralized TSM office should be established to aggressively coordinate and promote all TSM oriented actions and programs in Centre City, both in the public and private sectors.

It is also recommended that consideration be given to institutional changes on Centre City inter-agency coordination, that may expedite the implementation of the program, such as the establishment of a Centre City Task Force. This Task Force could comprise of directors and/or key senior staff of the various agencies. It could be either an advisory body, or it could be designated varying levels of authority. The function of such a body should as a minimum be the on-going consideration and resolution of implementation issues, that reports broadly supported recommendations to the appropriate agencies for their approval.

COST ESTIMATES

Cost estimates were prepared for the recommended improvements and are summarized by major category or action type, in Table D. Total costs for the Action Program are estimated on the order of $90-$134 million. The largest part of these costs would be attributable to improvements to the entry corridors to Centre City ($59-$103 million). The range of costs depends on whether auxiliary lanes on I-5 and SR-94 are obtained either by use of existing shoulders (which may only offer an interim solution) or widening and reconstruction (which would be a more permanent, longer term solution).

For improvements within Centre City, street system costs total almost $19 million, transit facilities about $2.5 million, and other modes almost $10 million. Chapter V of the report discusses costs in more detail, including the more regionally oriented costs of improved transit service to Centre City.

FINANCING

Numerous funding sources were identified and examined for applicability in funding the Transportation Program improvements, including federal, state and local governmental programs, as well as private sources.

While funds would be available from a variety of sources, it was concluded that overall, about half - or somewhere in the neighborhood of $45 million - of the total improvement costs may not be fundable without additional funding sources. While many of the more local projects within Centre City may be fundable to some degree, the key areas of potential funding shortages are likely to be on the entry corridors to Centre City, and the regional improvements to transit service to Centre City.

Potential new funding sources will thus need to be considered, particularly the local option sales tax, and various fees and exactions levied on Centre City private property owners and developers. Consideration is presently being given to a 1/2¢

TABLE D. COST SUMMARY FOR CENTRE CITY TRANSPORTATION IMPROVEMENTS

Category	Cost
Street System:	
Local Streets and Roads	$ 9.0 million
Freeway Ramps	9.8 million
Subtotal	$ 18.8 million
Centre City Entry Corridors:	
Interstate System	$ 2.6 - 30.1 million (1)
State Highway System	29.3 - 45.5 million (1)
Local Streets and Roads	27.2 million
Subtotal	$59.2 - 102.8 million
Transit:	
Local Centre City	$ 2.5 million
Other Modes:	
Pedestrian	$ 6.3 million
TSM/Rideshare	3.5 million
Subtotal	$ 9.8 million
TOTAL	$90.2 - 133.9 million

(1) The higher figure for addition of auxiliary lanes for I-5 and SR-94 assumes reconstruction to full standard freeway cross-section. The lower cost estimate provides for no reconstruction and would require use of existing shoulders, re-striping and re-dotting. Lower cost solution may only be approved by Caltrans/FHWA on understanding of full reconstruction at some future time.

ballot initiative in San Diego County, to be split equally for local roads, transit and State highways. The regional planning authorities forecast that some $3 billion in constant dollars would be generated for San Diego County over a 20-year period. Part of these funds could reasonably be expected to be channeled towards Centre City projects.

The other option would be development fees for new projects constructed in Centre City. Levies upon new Centre City developments or Centre City property owners could be reserved exclusively for Centre City-related improvements. The selection of the most appropriate mechanism will be important because many of the action items in the CCTAP could potentially be funded through impact fees and assessment districts, including many Centre City street improvements, ramp improvements, freeway signing, parking measures, transit facilities in Centre City (bus lanes, sidewalk improvements, transfer facilities, bus stops/shelters), pedestrian/bicycle facilities, and a TSM/rideshare office and program.

In conclusion, it is clear that Centre City is, in many cases, in direct competition with other areas of both the City and County for funding sources. A re-assessment of City/County wide priorities may thus be necessary to ensure that Centre City projects receive the appropriate priority. Alternative funding sources seem particularly attractive in that they would provide funds earlier, and in line with development as it occurs in Centre City.

SUMMARY

The following summarizes the recommended program, in relation to the principal objectives established in the study.

Multi-Modal Access

The recommended CCTAP is a balanced, multi-modal plan with proposals for improvement to highway systems (Centre City access corridors, Centre City street improvements, signing programs, and ramp improvements), transit systems (regional access improvements particularly trolley service, transit facilities and priority measures within Centre City), parking measures, pedestrian and bicycle systems, and rideshare/TSM programs. The recommended system and networks are integrated to allow good circulation for each mode, while minimizing conflicts between modes.

Access To and Between Major Centre City Activity Centers

The CCTAP provides for improved bus corridors through Centre City, recommends pedestrian and bicycle networks away from major traffic streets wherever possible and which provide strong access links between the core area and the waterfront, incorporates the Bayside LRT line, and the Gaslamp Trolley, as well as highway improvements both to increase roadway capacity on major streets and new links to improve access and to enable traffic loads to be more evenly spread across Centre City.

Maintain Transportation System Performance

The CCTAP recommendations include provisions for additional capacity where necessary for both highway and transit, and through measures such as the revised Preferred Street System, establishment of a Preferred Bus System, and street improvements such as extensions to Imperial, Front/First and B Streets, improves circulation flow so that the maximum effectiveness is obtained from available capacity, and traffic loads are spread more evenly across Centre City rather than being focused on a few over-congested corridors.

Maintain Visual/Physical Quality

The CCTAP recommendations should not only maintain but also improve the visual and physical quality of the downtown transportation system. The primary contributions to this objective are the pedestrian and bicycle network recommendations and proposed sidewalk and bus waiting area improvements. Furthermore, none of the recommendations include aerial or obtrusive structures.

Realistically Attainable and
Flexible Program

The CCTAP recommendations meet the established goals and objectives, and have been developed with on-going interagency coordination, input and review during the study process. The financing analysis indicated potential shortfalls in funding, but with the development of a private financing mechanism for at least some of the projects, and a potential re-prioritization of the importance of Centre City with regard to the rest of the metropolitan region, these shortfalls should stand a very good chance of being overcome. Flexibility of the plan is ensured by the quantitative tool that will be left with the City of San Diego that will allow ongoing monitoring, review of alternative strategies or new ideas in response to changing development conditions, and sensitivity analyses of any potential changes to the action program.

Implementable Plan with Participation and
Support by Public and Private Sector

Centre City public agencies and private sector institutions provided excellent cooperation and support throughout the study. This should provide a sound base for the extensive cooperation that will be necessary between these bodies to ensure a supported and implemented plan. The CCTAP offers suggestions for CCTAP implementation procedures, which will need to be developed into an operable system of inter-agency support for a long-term program. The recommendation for a centralized Transportation Systems Management office to coordinate rideshare and transit incentive programs should also be able to play a key role in securing private sector support for and involvement in the plan.

I.
EXISTING CONDITIONS

This chapter summarizes the analysis of existing traffic and transportation conditions in Centre City. It includes a description of the street system in Centre City and an evaluation of current traffic conditions; a description of the transit system in Centre City and a discussion of transit service conditions; and a review of parking in Centre City. The final section summarizes transportation characteristics and existing problems and constraints regarding the transportation system in Centre City.

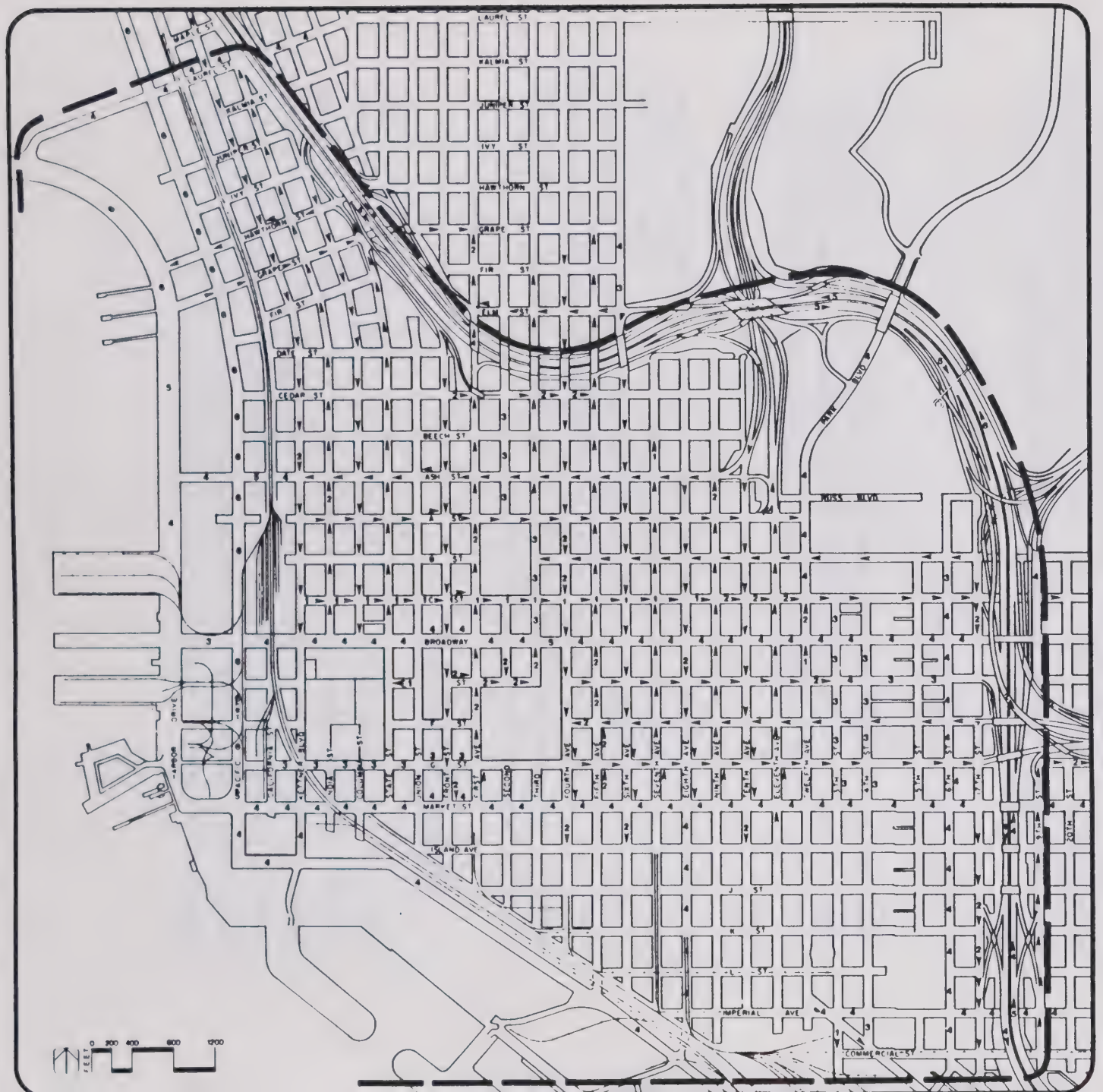
A. STREET SYSTEM DESCRIPTION

The geographic extent of the study area for the Centre City Transportation Action Program is illustrated in Figure 1. The study area extends from San Diego Bay to the I-5 Freeway, to Laurel Street in the north, and to Commercial Street in the south.

As Centre City is bounded by San Diego Bay to the west and south, ground access to Centre City is largely from the north, east, and southeast. Access from these directions is also limited, due to the physical barrier formed by the I-5 Freeway. The location of the major access points to Centre City, both freeway ramps and surface streets, have had a clear influence on the development and functioning of the current street system within Centre City.

1. ACCESS TO CENTRE CITY

Three freeways provide access to Centre City. The I-5 Freeway runs northwest and southeast from Centre City. I-5 links Centre City to communities in the northwest area of San Diego and the coastal corridor of North San Diego County. To the south, I-5 connects to National City, Chula Vista, and the international border. As I-5 skirts the northern and eastern margins of Centre City, numerous ramps provide access to various parts of the Centre City area.



CENTRE CITY
Transportation Action Program

Legend:

NOTES:

1. STREETS ARE TWO DIRECTIONAL EXCEPT WHERE INDICATED.

2. TWO-WAY STREETS ARE ONE LANE IN EACH DIRECTION, EXCEPT WHERE INDICATED.

3. ONE-WAY STREETS ARE THREE LANES, EXCEPT WHERE INDICATED.

FIGURE 1
EXISTING STREET SYSTEM CHARACTERISTICS

prc
PRC Engineering, Inc.

State Route 94 provides the principal freeway access to Centre City from eastern San Diego communities, as well as cities such as Lemon Grove, La Mesa, and El Cajon. SR-94 ends at the I-5 freeway on the eastern margin of Centre City, with access continuing to Centre City via F and G Streets. State Route 163 provides freeway access to Centre City from the north. SR-163 passes through Balboa Park and ends at I-5. Access to Centre City is in the area of Tenth and Eleventh Avenues.

Surface street access to Centre City is limited from the regional system, with the majority of surface streets serving primarily the local communities adjacent to Centre City. In the northwest of the study area, Harbor Drive and Pacific Highway are the major access roadways to Centre City from the airport and Point Loma areas. Kettner Boulevard and India Street form a one-way couplet into/out of this part of Centre City, on either side of the I-5 Freeway. Along the northern boundary of Centre City, key surface access streets are First Avenue, and Fourth, Fifth, and Sixth Avenues. At the northeastern margin of Centre City, surface access is limited to Park Boulevard.

A number of surface streets provide access across the eastern margin of Centre City, the key ones being the B/C Street couplet, Broadway, Market Street, and Imperial Avenue. At the southeast corner of the study area, surface access is provided by Logan Avenue, National Avenue, and Harbor Drive.

2. CENTRE CITY STREET SYSTEM

The large part of the Centre City street system comprises a grid network, based on comparatively small, rectangular blocks. A typical Centre City block dimension is about 200 feet in the east-west direction, and 300 feet north-south.

North of Market Street and west of Twelfth Avenue, many of the streets are one-way and typically provide for three traffic lanes with two parking lanes in most cases. The principal exceptions to this system are Broadway, Market Street, Pacific Highway, and Harbor Drive, all of which are all two-way streets. South of Market, in the industrial areas, the street system comprises almost exclusively two-way local streets.

Only a few streets completely traverse the entire area of Centre City. This is due to a variety of reasons, including the railroad tracks acting as a barrier, multi-block land uses near the waterfront such as the County Government Building and the military facilities, and the Civic Centre and Horton Plaza, both of which extend over a number of blocks in the central core area of Centre City.

As a result, only Broadway and Market Street extend unbroken through Centre City in an east-west direction from Harbor Drive at the west to I-5 in the east. Only one other street, Ash Street, connects to Harbor Drive, which runs westerly from Eleventh Avenue. In the north-south direction, only Pacific Highway, Kettner Boulevard, Fifth Avenue, and Eighth Avenue extend across Centre City from I-5 in the north to Harbor Drive in the south.

Figure 1 shows the travel direction and number of lanes for the Centre City street system. The principal travel corridors within Centre City are described briefly below.

Harbor Drive/Pacific Highway

These are both two-way streets providing north-south movement along the western margin of Centre City. Harbor Drive continues southeast beyond Market Street, as the principal access to the waterfront area. Neither Harbor Drive nor Pacific Highway are directly connected to I-5. Freeway access from this corridor is via either Hawthorne or Grape, or to the north at the Sassafras/Washington ramp.

Kettner Boulevard/India Street

These streets form a one-way couplet providing access between the area of I-5 to the northwest of Centre City, and the Columbia area to the west of the Centre City core. Kettner provides southbound access from I-5 via the Sassafras Street/Airport off-ramp. India provides northbound access to I-5 via the Washington street on-ramp. Only Kettner Boulevard extends south of Broadway and connects to Harbor Drive.

Front Street/First Avenue

These two streets form a key north-south one-way couplet linking I-5 to the central core and Market Street. The principal I-5 southbound off-ramp to Centre City feeds directly into southbound Front Street, while northbound First Avenue provides access from Centre City to both southbound and northbound I-5 on-ramps.

Fourth/Fifth/Sixth Avenues

These streets represent another key one-way system providing access between the I-5 freeway and the core area. Fourth and Sixth Avenues are one-way southbound, and Fifth Avenue is one-way northbound. These streets serve I-5 off-ramps at Fourth and Sixth, an I-5 on-ramp at Fifth, as well as provide access to the areas north of I-5. Fifth Avenue, south of Market Street, is a two-way street which passes through the Gaslamp District and connects to Harbor Drive.

Tenth/Eleventh/Twelfth Avenues

Tenth and Eleventh Avenues form a one-way couplet providing access to/from the SR-163 and I-5 freeways from the eastern part of Centre City and Market Street. South of C Street, Twelfth Avenue is the route of the trolley into Centre City.

Laurel/Hawthorne/Grape Streets

These three streets are major travel corridors across the northwest corner of Centre City, functioning primarily as connectors between the Airport/Point Loma area and the I-5 freeway. Laurel Street is two-way, serving largely to connect I-5 traffic from the north, to Harbor Drive. Hawthorne and Grape Streets are a one-way couplet which link Harbor Drive to I-5 ramps.

Ash/A Streets

These two streets form the principal east-west one-way couplet on the north side of Centre City. Both streets serve SR-163 and I-5 ramps at Tenth/Eleventh Avenues and connect to the major north-south travel corridor through Centre City.

While Ash Street extends all the way to Harbor Drive, A Street extends only as far west as Kettner Boulevard.

B/C Streets

B Street is a key one-way inbound street to Centre City leading directly into the core area as far as Third Avenue. C Street is the trolley route between Kettner Boulevard and Twelfth Avenue. East of Twelfth, C Street provides access to southbound I-5 at 17th Street.

Broadway

Broadway is a two-way street that connects east-west across the entire Centre City area from I-5 to Harbor Drive. It is both a major traffic and transit corridor through the heart of downtown, linking together all of the major north-south traffic routes. The majority of transit lines serving Centre City are routed down Broadway.

F/G Streets

These streets form a key east-west one-way couplet connecting the SR-94 ramps at 17th Street, to the core area. The couplet extends as far west as Fourth Avenue, where F Street ends at Horton Plaza, and G Street continues to Pacific Highway as a two-way local street.

Market Street

Market Street is a major two-way street running east-west through the southern part of Centre City, from I-5 to Harbor Drive. Market Street is the southern limit of the principal circulation system in Centre City, with many of the north-south couplets terminating at Market, and continuing south as two-way local streets.

3. PREFERRED STREET SYSTEM FOR CENTRE CITY

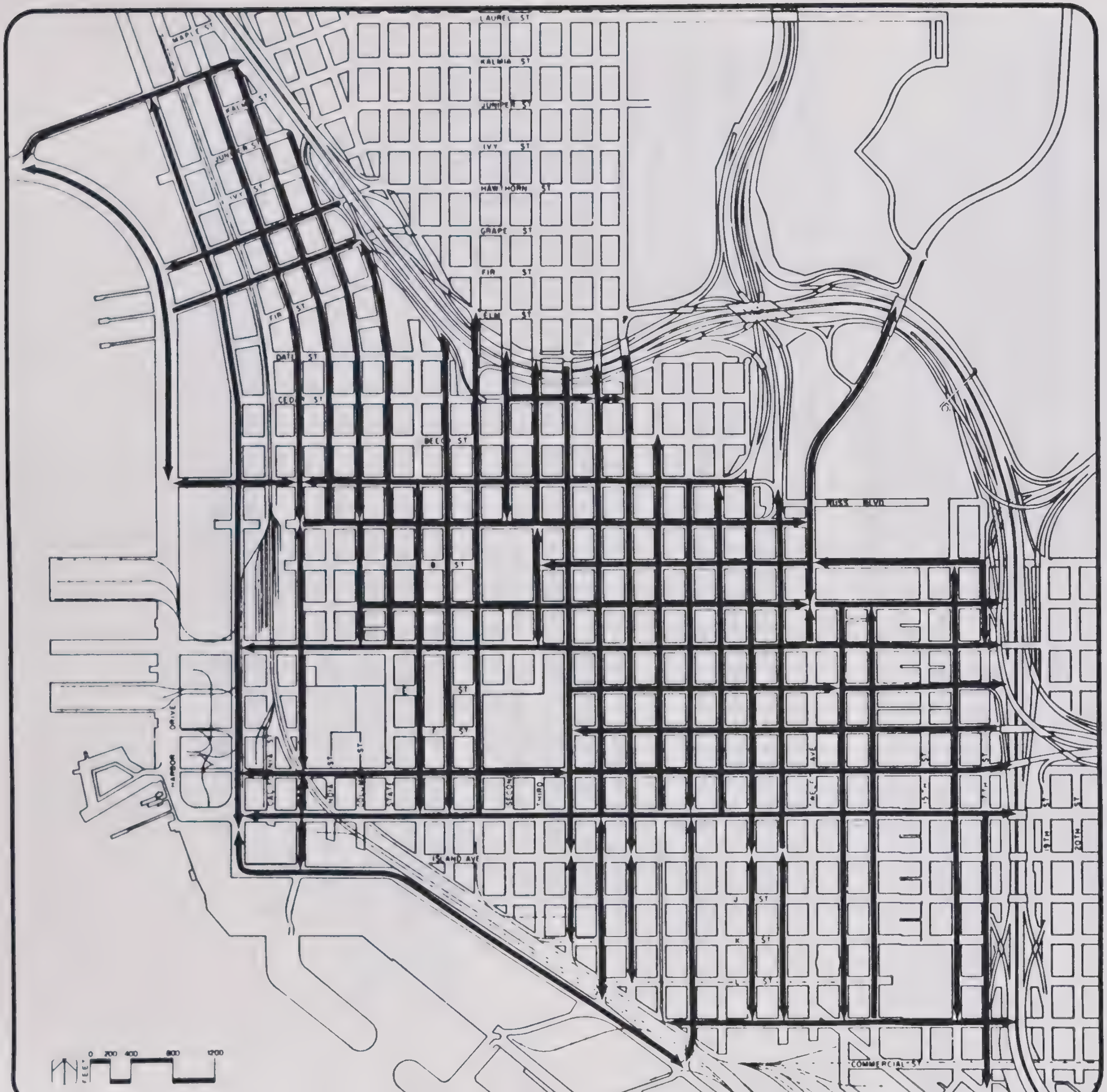
In 1981, the City of San Diego adopted by resolution, with subsequent amendments[1] in 1982 and 1983, a system of "preferred streets" for Centre City. The purpose was "to establish a system of preferred streets...including the designated direction of traffic flow, (that) shall be the minimum system of streets considered essential to the orderly development of Centre City." This preferred street system is illustrated in Figure 2 and described in Table 1. Most of the preferred street system is already in place in Centre City, with the key exceptions of: Kettner Boulevard between "G" and "A" (currently one-way southbound); Thirteenth Street between "C" and National (currently two-way); Fourteenth Street between National and "C" (currently two-way). It should also be noted that the preferred street system resolution recognized the dynamic nature of downtown development and the need for frequent review and possible changes over time.

4. TRAFFIC CONTROL IN CENTRE CITY

There are approximately 175 traffic signals in the Centre City area. The locations of these signals are shown in Figure 3. The majority of signals are in the area bounded by Ash Street, Twelfth Avenue, Market Street, and Kettner Boulevard. Within this core area, traffic signals are located at most intersections. Outside of this area, signals are located primarily along major access corridors, such as Pacific Highway, Harbor Drive, the Hawthorne/Grape couplet, and 16th Street. Two areas of Centre City currently have very few traffic signals, one being in the north between Ash Street and Grape Street, and the other being the entire area south of Market Street. A new computer-controlled system for most of the traffic signals in Centre City was installed recently and is now completely operational. This system has been designed to optimize signal settings throughout Centre City to achieve the most efficient traffic flow.

---

1 City of San Diego Council Resolution No. 255020, dated 9/15/81; Resolution No. 256223, dated 4/19/82; Resolution No. 258220, dated 4/11/83.



CENTRE CITY
Transportation Action Program

Legend:

SOURCE: COUNCIL RESOLUTION NO. 258220 DATED 4-11-83 (SEE ALSO APPENDIX A FOR FURTHER NOTES)

**FIGURE 2
EXISTING PREFERRED STREET SYSTEM FOR CENTRE CITY**

prc
PRC Engineering, Inc.

TABLE 1. EXISTING PREFERRED STREET SYSTEM FOR CENTRE CITY

Street	Limits	Existing Flow	Change Flow to
North Harbor Dr.	Ash to Laurel	2-Way	
Pacific Highway	Harbor Dr. to Laurel	2-Way	
Harbor Drive	8th Ave. to Pacific Hwy	2-Way	
Kettner Blvd.	Harbor to Market	Closed	
Kettner Blvd.	Market to "G"	2-Way	
Kettner Blvd.	"G" to "A"	1-Way SB	2-Way
Kettner Blvd.	"A" to Laurel	1-Way SB	
India Street	"A" to Laurel	1-Way NB	
Columbia Street	Broadway to "A"	2-Way	
Columbia Street	"A" to I-5	1-Way NB	
State Street	Broadway to Ash	2-Way	
State Street	Ash to I-5	1-Way NB	
Union Street	Market to Ash	2-Way	
Front Street	Market to I-5	1-Way SB	
First Avenue	Market to I-5	1-Way NB	
Second Avenue	"A" to I-5	2-Way	
Third Avenue	Broadway to "A"	2-Way	
Third Avenue	"A" to I-5	1-Way NB	
Fourth Avenue	"K" to Island	2-Way	
Fourth Avenue	Island to I-5	1-Way SB	
Fifth Avenue	Harbor to Market	2-Way	(2-Way w/special treatment to
Fifth Avenue	Market to "C"	1-Way NB	accommodate gas-
Fifth Avenue	Market to Broadway	1-Way NB	lamp development)
Fifth Avenue	"C" to I-5	1-Way NB	
Sixth Avenue	"L" to Island	2-Way	
Sixth Avenue	Island to I-5	1-Way SB	
Seventh Avenue	Market to Beech	1-Way NB	
Eighth Avenue	Harbor to Market	2-Way	
Eighth Avenue	Market to Ash	1-Way SB	
Ninth Avenue	Market to Ash	1-Way NB	
Tenth Avenue	Imperial to Island	2-Way	
Tenth Avenue	Island to Ash	1-Way SB	
Eleventh Avenue	Imperial to Island	2-Way	
Eleventh Avenue	Island to Russ Blvd.	1-Way NB	
Twelfth Avenue	Broadway to "C"	1-Way NB	
Twelfth Avenue	"C" to I-5	2-Way	
Thirteenth Street	"C" to National	2-Way	1-Way SB
Fourteenth Street	National to "C"	2-Way	1-Way NB
Sixteenth Street	Imperial to "B"	2-Way	
Seventeenth Street	Logan to Market	1-Way SB	
Seventeenth Street	Broadway to "B"	1-Way SB	
Laurel Street	North Harbor to I-5	2-Way	
Hawthorne Street	North Harbor to I-5	1-Way WB	
Grape Street	North Harbor to I-5	1-Way EB	
Cedar Street	Second to Fifth	1-Way EB	
Cedar Street	Fifth to Sixth	2-Way	

(Continued)

TABLE 1. EXISTING PREFERRED STREET SYSTEM FOR CENTRE CITY (Continued)

Street	Limits	Existing Flow	Change Flow to
Ash Street	North Harbor to Kettner	2-Way	
Ash Street	Kettner to Tenth	1-Way WB	
"A" Street	Kettner to Twelfth	1-Way EB	
"B" Street	Third to Twelfth	1-Way WB	1-Way WB
"B" Street	Twelfth to I-5	1-Way WB	
"C" Street	Columbia to Twelfth	1-Way EB	
"C" Street	Twelfth to I-5	1-Way EB	
Broadway	Pacific to I-5	2-Way	
"E" Street	Fourth to Thirteenth	1-Way EB	
"E" Street	Thirteenth to I-5	2-Way	1-Way EB
"F" Street	Fourth to I-5	1-Way WB	
"G" Street	Pacific Hwy to Fourth (3)	1-Way EB	
"G" Street	Fourth to I-5 (3)	1-Way EB	
Market Street	Pacific Highway to I-5	2-Way	
Imperial Avenue	Eighth to I-5	2-Way	

GENERAL

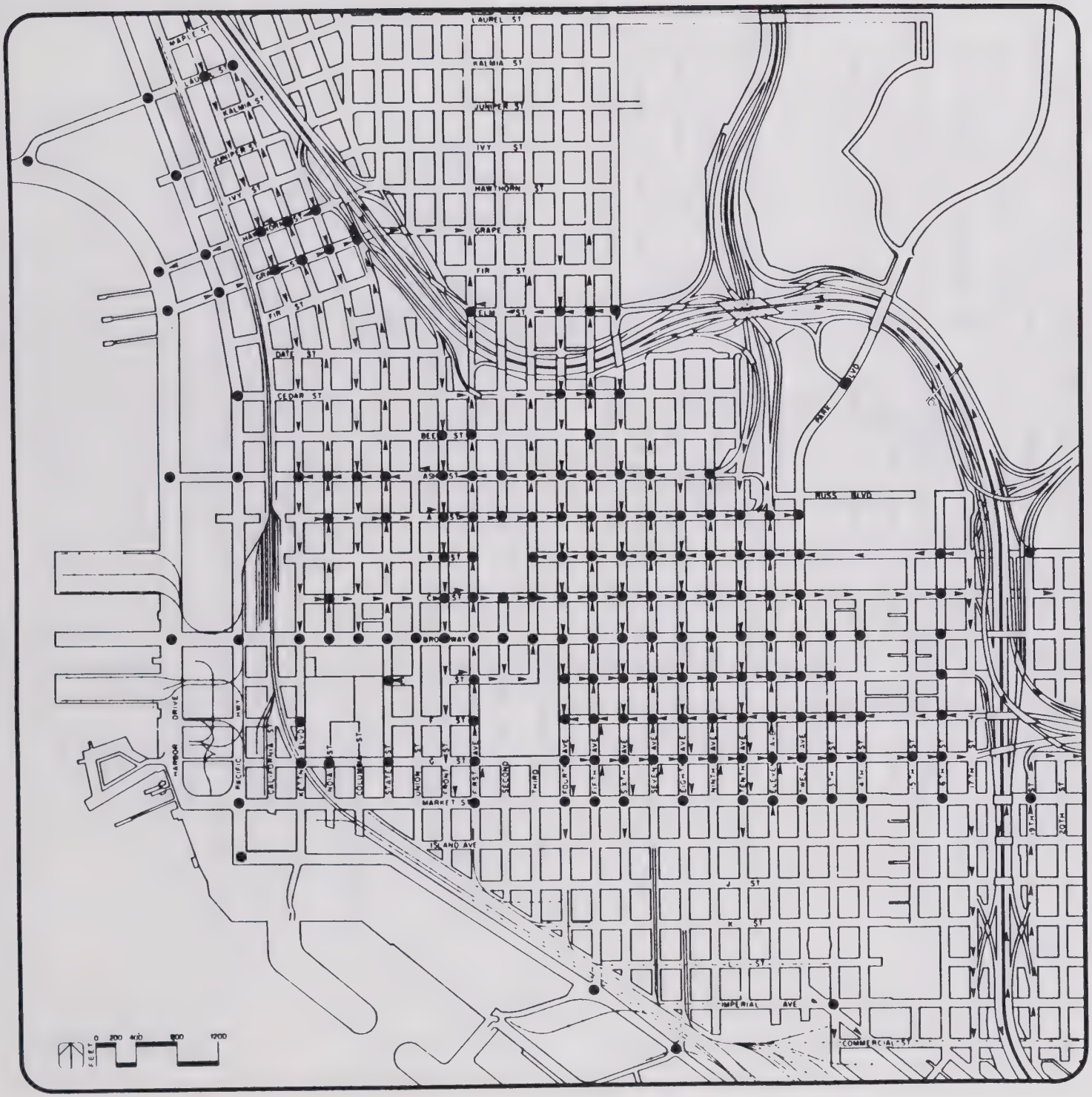
A. Horton Plaza project requires access via the following - Second Avenue, Market to "G"; Second Avenue, "E" to Broadway; Third Avenue, Market to "G"; Third Avenue, "E" to Broadway; "E" Street, Front Street to First Avenue; and "F" Street, Front Street to First Avenue.

B. Implementation of this preferred system of streets may require additional capital improvements to minimize congestion and delay as development and redevelopment occurs in Centre City.

C. Changes in direction of existing traffic flow will be implemented on an "as needed" basis, when justified and approved by Council.

D. Developers may rely upon Fifth Avenue from "C" to the I-5 connections, Seventh Avenue from Market to Beech and Ninth Avenue from Market to Ash continuing as one way northbound as set out in Table 1. The Council recognizes that these important northbound streets are critical for egress out of downtown San Diego and further than any changes in direction of those streets will have a detrimental impact upon that section of Downtown San Diego that is currently developing "B" Street as the primary Financial District.

Source: City of San Diego - Council Policy Number 600-32, 4/11/83.



CENTRE CITY
Transportation Action Program

Legend:

FIGURE 3
LOCATION OF TRAFFIC SIGNALS IN CENTRE CITY

prc
PRC Engineering, Inc.

B. EXISTING TRAFFIC CONDITIONS

1. TRAFFIC VOLUMES

The following discussion documents existing traffic volumes on the freeways adjacent to Centre City, freeway on/off ramps, and Centre City streets.

Freeway and Ramp Volumes

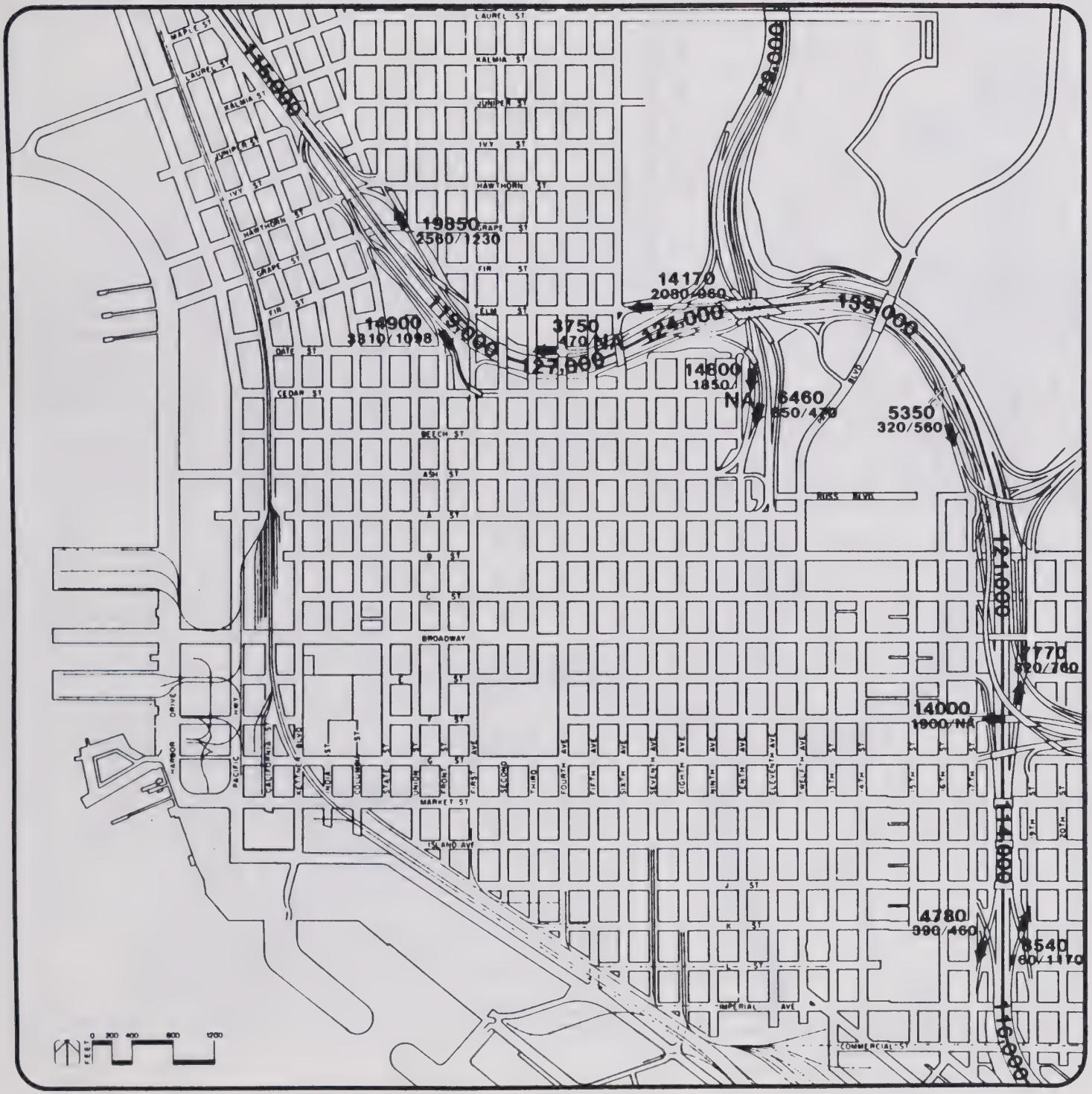
The I-5 freeway carries about 115,000 average daily traffic volumes (ADT) at both the northern and southern margins of Centre City, and 124,000 - 127,000 ADT between First and Tenth Avenues. The most heavily traveled section is between SR-163 and Pershing Drive (139,000 ADT). SR-163 carries 79,000 ADT approaching Centre City, and the current volume on SR-94 just east of Centre City is 78,000 ADT. Figure 4 shows mainline freeway volumes, and the location of and traffic volumes on the freeway off-ramps to Centre City. Figure 5 shows similar information for freeway on-ramps.

A total of 23 freeway ramps connect the Centre City street system to the three freeways serving the central area. Twelve are on-ramps, and eleven are off-ramps. Many of these ramps are to/from I-5, although traffic using these ramps does not necessarily remain on I-5, since the I-5 ramps are also used to access SR-163 and SR-94. Table 2 lists the freeway ramps currently serving Centre City.

For access to Centre City, the highest ramp volumes are at SR-163 at Tenth and Eleventh Avenues, SR-94 at F and G streets, and the I-5 ramps between First and Sixth Avenues. The ten highest-volume ramps which together comprise almost 70 percent of total ramp volume into/out of Centre City are listed in Table 3.

Centre City Cordon

A cordon line defined around Centre City is illustrated in Figure 6, along with existing daily traffic volumes on all of the streets that cross it (i.e., provide access to Centre City). There are a total of 286,000 vehicles a day that cross the cordon in both directions, travelling into and out of Centre City, as shown in Table 4.



CENTRE CITY
Transportation Action Program

Legend:

DAILY TRAFFIC
XXXX
XX/XX
AM PEAK HOUR
PM PEAK HOUR

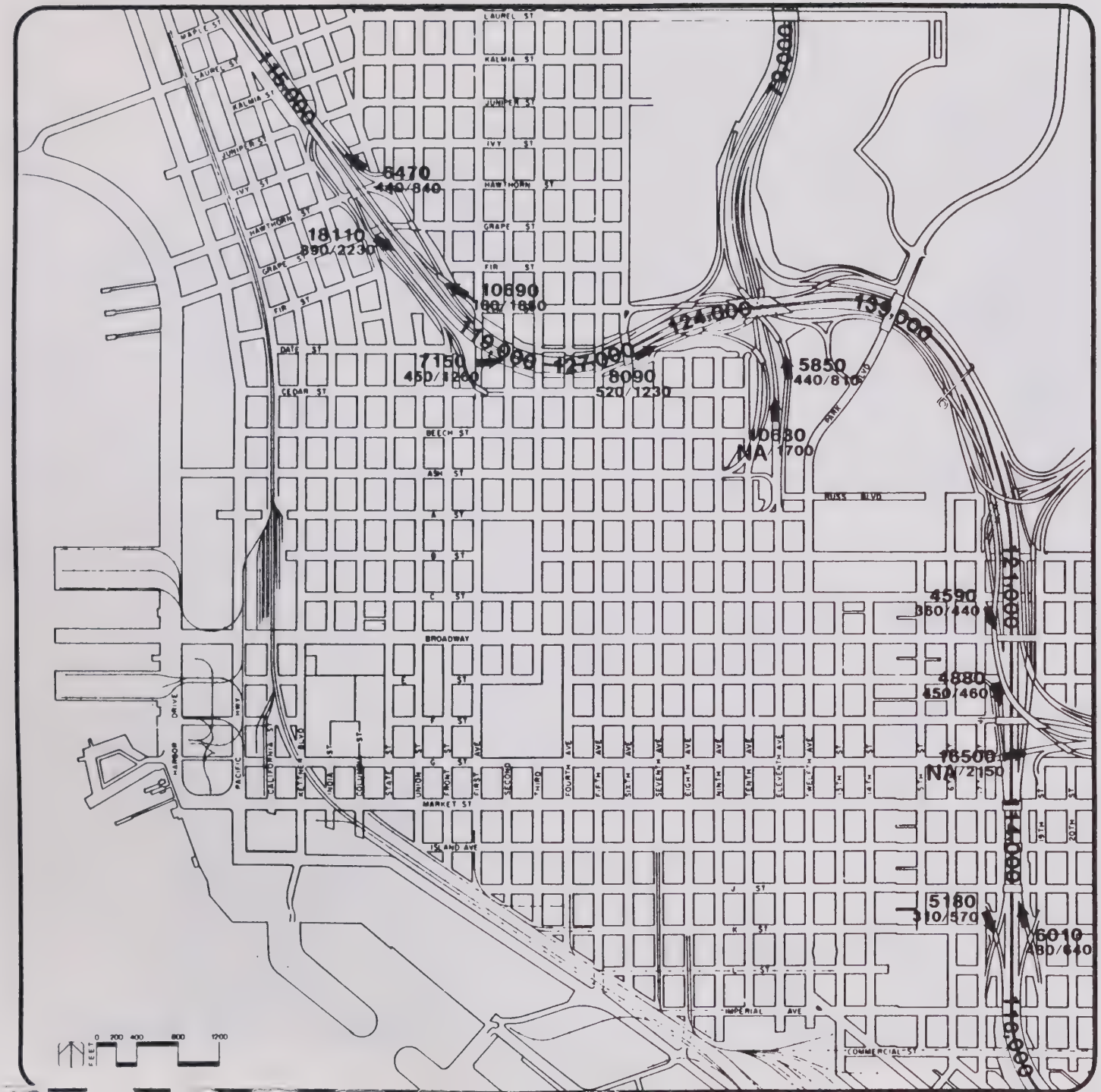
NOTE: MAINLINE FREEWAY VOLUMES SHOWN ARE DAILY TWO-WAY.

SOURCE: CALTRANS. TRAFFIC VOLUMES ON CALIFORNIA STATE HIGHWAYS IN DISTRICT II, 1969-1983

NA-NOT AVAILABLE

FIGURE 4
FREEWAY OFF-RAMP LOCATIONS AND TRAFFIC VOLUMES

prc
PRC Engineering, Inc.



CENTRE CITY
Transportation Action Program

Legend:

XXXX — DAILY TRAFFIC
XX/XX
AM PEAK HOUR / PM PEAK HOUR

NOTE: MAINLINE FREEWAY VOLUMES SHOWN ARE DAILY TWO-WAY.

SOURCE: CALTRANS. TRAFFIC VOLUMES ON CALIFORNIA STATE HIGHWAYS IN DISTRICT II, 1969-1983

NA-NOT AVAILABLE

FIGURE 5
FREEWAY ON-RAMP LOCATIONS AND TRAFFIC VOLUMES

prc
PRC Engineering, Inc.

TABLE 2. FREEWAY RAMPS SERVING CENTRE CITY

A. OFF-RAMPS TO CENTRE CITY

I-5 northbound to downtown

- J Street (also access to east on 94)
- B Street
- 6th Avenue
- Hawthorne Street

I-5 southbound to downtown

- Front/2nd Avenue
- 10th Avenue
- B Street/17th Street
- Imperial Avenue

SR-94 west to downtown

- F Street
  (westbound SR-94 traffic can also enter downtown via I-5 northbound and Sixth Avenue exit)

SR-163 southbound to downtown

- Ash Street/Tenth Avenue
- 4th Avenue

B. ON-RAMPS FROM CENTRE CITY

I-5 southbound from downtown

- Grape Street
- 1st Avenue
- 5th Avenue
- C Street
- E Street
- J/K Streets

I-5 northbound from downtown

- Hawthorne Street
- Elm Street/1st Avenue
- 11th Avenue
- Imperial Avenue

SR-94 east from downtown

- G Street
  (eastbound SR94 traffic can also access freeway via First and Fifth Avenue I-5 southbound ramps)

SR-163 northbound from downtown

- A Street/11th Avenue
  (northbound SR-163 traffic can also access freeway via First Avenue I-5 southbound ramp)

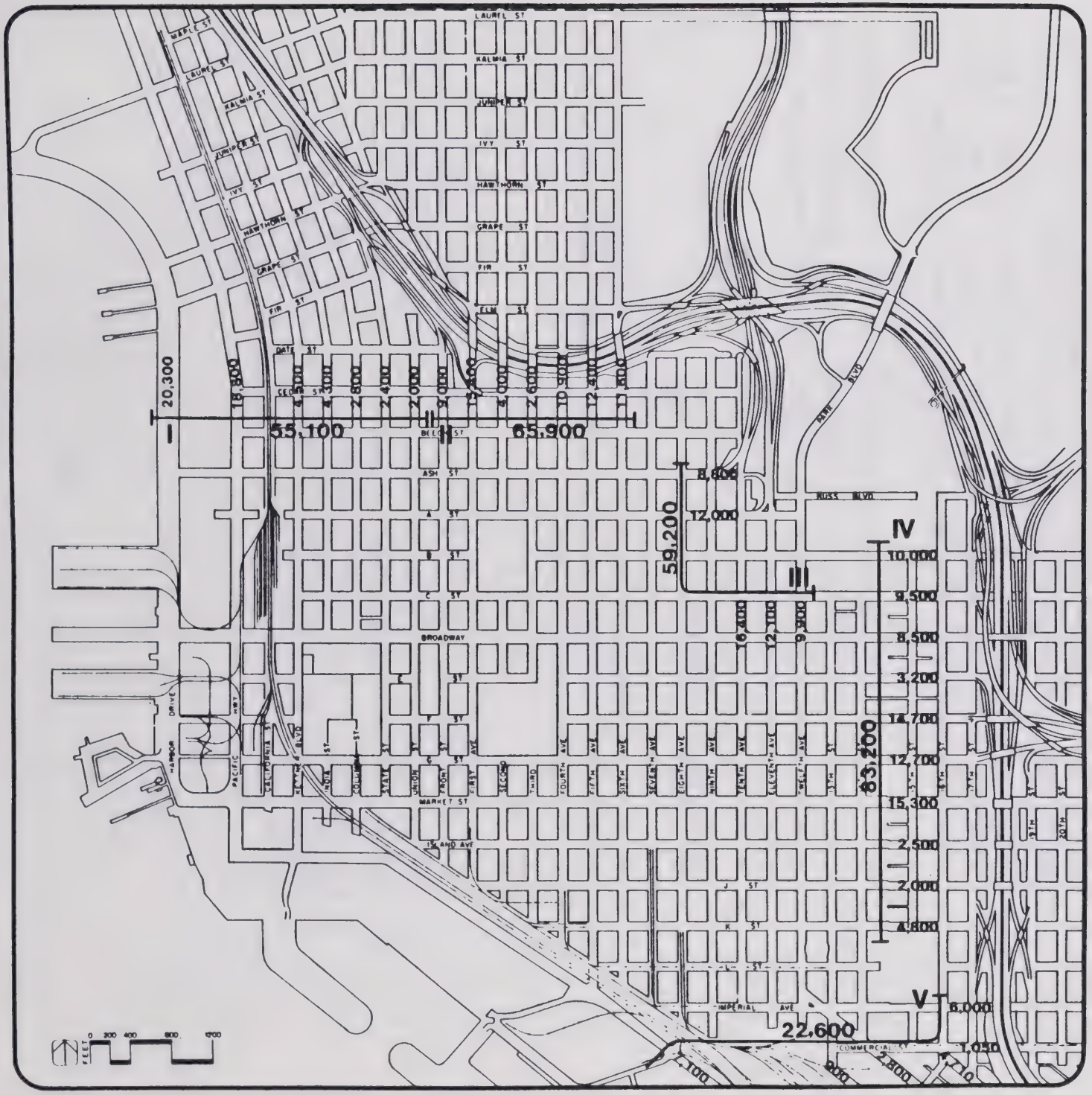
TABLE 3. HIGHEST VOLUME FREEWAY RAMPS IN CENTRE CITY

Ramp Location	On/Off	No. of Lanes	ADT	PM Peak Hour
SR-94/G St.	On	3	16,500	2,150
I-5/Front St.	Off	2	14,900	3,310
SR-163/Tenth Ave.	Off	2	14,800	N/A
I-5/Sixth Ave.	Off	2	14,170	960
SR-94/F Street	Off	3	14,000	N/A
I-5/First St.	On (n/bd)	1	10,700	1,850
SR-163/Eleventh	On	1	10,630	1,700
I-5/J Street	Off	1	8,540	1,170
I-5/Fifth Ave.	On	1	8,090	1,230
I-5/B St.	Off (n/bd)	1	7,770	760

Source: Caltrans District 11.

TABLE 4. DAILY TRAFFIC CROSSING CENTRE CITY CORDON

Cordon Segment		2-Way ADT	% of Total
I.	North-West	55,100	19
II.	North	65,900	23
III.	North-East	59,200	21
IV.	East	83,200	29
V.	South-East	22,600	8
Total		286,000	100



CENTRE CITY
Transportation Action Program

Legend:

- I NORTH-WEST SEGMENT
- II NORTH SEGMENT
- III NORTH-EAST SEGMENT
- IV EAST SEGMENT
- V SOUTH-EAST SEGMENT

SOURCE: CITY OF SAN DIEGO TRAFFIC DATA, 1981-1984

FIGURE 6
CENTRE CITY CORDON, AND EXISTING TRAFFIC VOLUMES

prc
PRC Engineering, Inc.

Approximately 63 percent of traffic enters Centre City from the north, while the remaining 37 percent enters from the east and south-east. Across the northern cordon, traffic loads are spread evenly between the northwest, north and northeast segments.

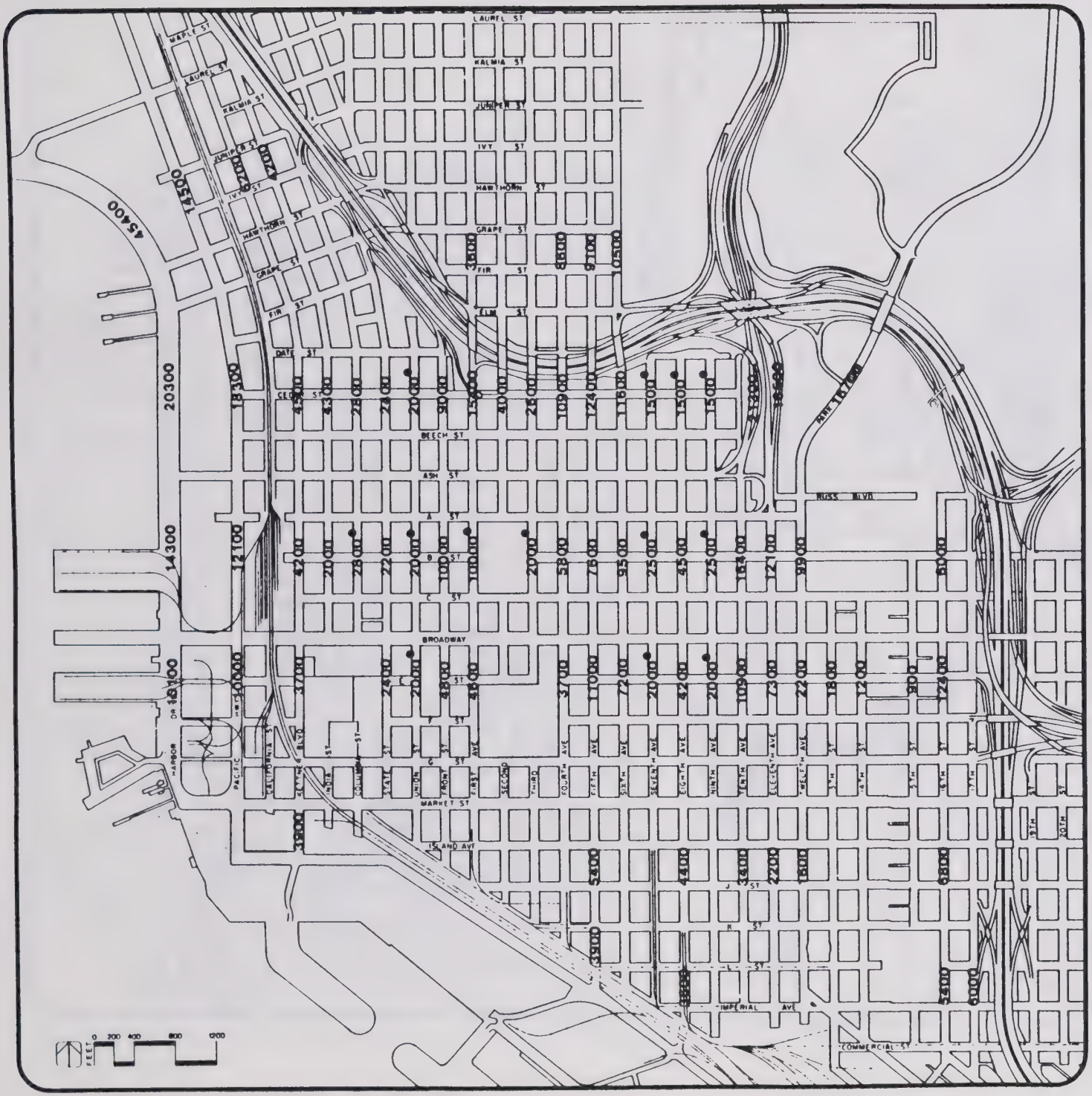
Across the north-west cordon 70 percent of the traffic load occurs on Harbor Drive (20,300 ADT) and Pacific Highway (18,300 ADT). The most heavily travelled streets across the north cordon are Front Street (9,000 ADT), First Avenue (15,400 ADT), and Fourth (10,900 ADT), Fifth (12,400 ADT) and Sixth (11,600 ADT) Avenues. The highest-volume streets across the eastern cordon are Market Street (15,300 ADT), F Street (14,700 ADT) and G Street (12,700 ADT). Traffic approaching Centre City from the south on I-5 also crosses this cordon to enter downtown. The south-east cordon carries the least traffic volume. Traffic volumes are highest on Imperial Avenue (6,000 ADT) and Harbor Drive (7,100 ADT).

While a total of 35 streets provide access to/from Centre City, about 80 percent of the total traffic crossing the cordon is carried on only 18 of these streets. About 50 percent of total traffic crossing the corridor is on streets providing direct or principal access to freeway ramps.

Traffic Volumes in Centre City

Daily traffic volumes in Centre City are illustrated in Figure 7 for north-south streets and in Figure 8 for east-west streets. The traffic volumes on the street system within Centre City are influenced heavily by the access routes to Centre City.

Thus, for north-south oriented streets, the heaviest traffic volumes occur on Harbor Drive; Pacific Highway; Front Street; First Avenue; Fourth, Fifth, Sixth Avenues; Tenth and Eleventh Avenues; 16th Street. Daily volumes on these streets are typically in the 10,000-15,000 ADT range north of Broadway, and 5,000-10,000 ADT south of Broadway. In many cases, traffic loads on other north-south streets are less than 5,000 ADT.



CENTRE CITY
Transportation Action Program

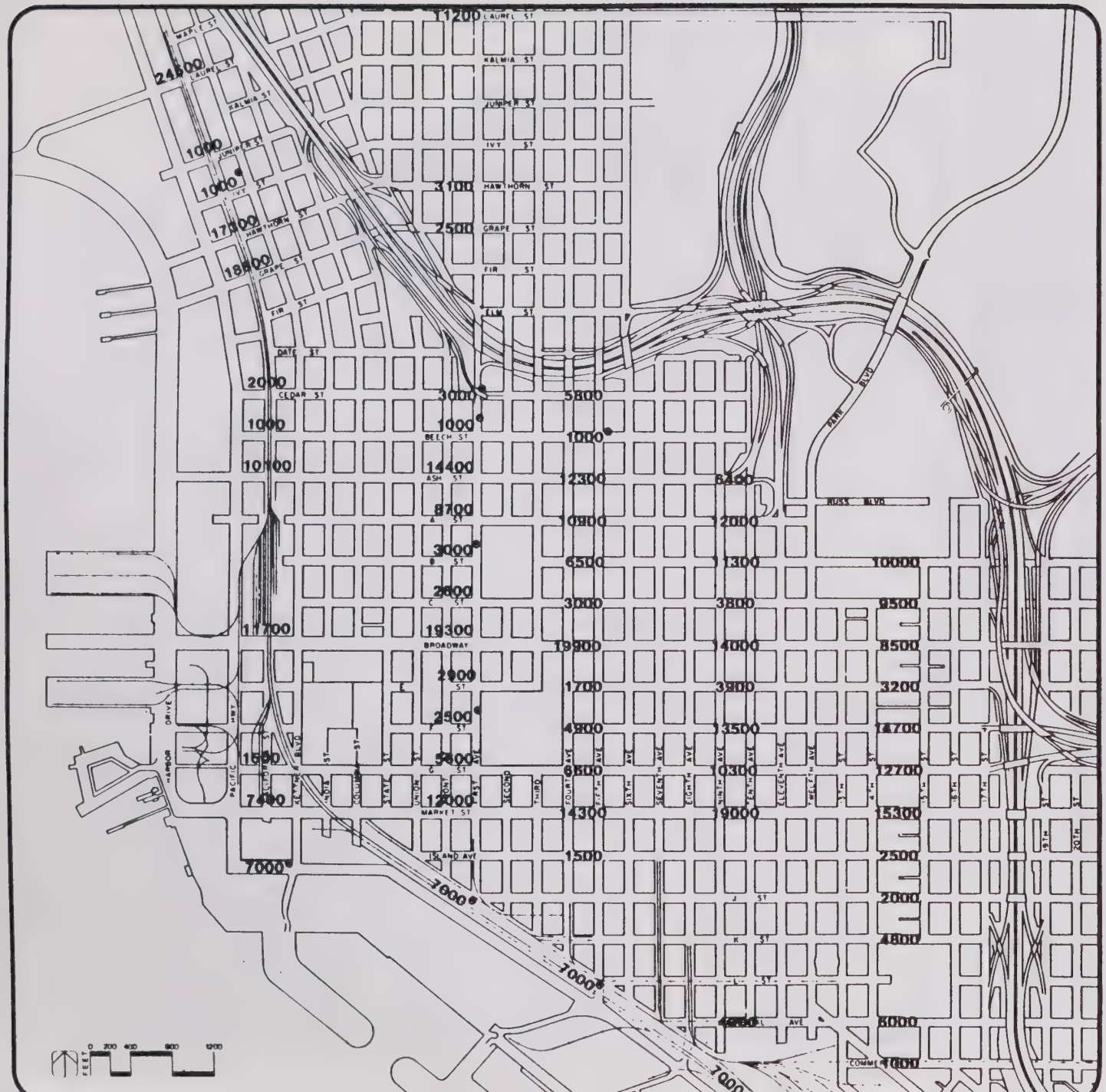
Legend:

"e" – INDICATES ESTIMATE

SOURCE: CITY OF SAN DIEGO TRAFFIC DATA, 1981-1984

FIGURE 7
EXISTING DAILY TRAFFIC VOLUMES-NORTH/SOUTH DIRECTION

prc
PRC Engineering, Inc.



CENTRE CITY Transportation Action Program

Legend:

"e" –INDICATES ESTIMATE

SOURCE: CITY OF SAN DIEGO TRAFFIC DATA, 1981-1984

FIGURE 8
EXISTING DAILY TRAFFIC VOLUMES– EAST/WEST DIRECTION

prc
PRC Engineering, Inc.

For east-west streets in Centre City, the highest traffic volumes are on the Ash Street/A Street couplet, Broadway and Market Street. On the eastern side of Centre City, both the B Street/C Street and F Street/G Street couplets carry high traffic loads. These higher-volume streets typically carry on the order of 10,000 to 15,000 ADT, although Broadway, both between Front Street and Fifth Avenue, and Market Street around Ninth/Tenth Avenues, carry up to 19,000-20,000 ADT.

2. TRAFFIC FLOW CHARACTERISTICS

The peak traffic volumes occur in the late afternoon between 4:00-6:00 p.m., with the actual peak hour occurring between 4:30-5:30 p.m. In total, traffic flow across the Centre City cordon is about 33 percent higher during the afternoon peak hour than during the morning peak hour. Within Centre City, traffic volumes are relatively constant between noon and 6:00 p.m. with the same peak hour, but less of a peak effect than is exhibited at the cordon.

Westbound traffic peaks in the morning and midday, while eastbound traffic peaks heavily in the late afternoon. Both northbound and southbound traffic exhibit similar hourly profiles, both peaking in the late afternoon.

Vehicle Classification

About 79 percent of traffic in Centre City is automobiles with a further 15 percent being light trucks (pick-ups). Other vehicle types together comprise only 6 percent of all traffic on the roadway system. Of these other vehicle types, heavy trucks comprise 2 percent of all traffic, taxis about 1 percent, and motorcycles about 1 percent. At the locations surveyed, buses comprised 1 percent of all traffic, although this percentage varies by location within Centre City. Bicycles constitute a negligible portion of traffic flow. There is little difference in the composition of the traffic flow between locations within Centre City and locations on the cordon.

Vehicle Occupancy

A vehicle occupancy survey (including all vehicles except transit) yielded the following results: Overall, 72 percent of vehicles were travelling with a single

occupant, and 21 percent were travelling with two occupants. Only 6 percent of all vehicles had more than two occupants. Average vehicle occupancy was 1.41 persons per vehicle. Profiles were similar between internal Centre City locations and locations on the cordon. Crossing the cordon into/out of Centre City during the afternoon peak period, the average vehicle occupancy is 1.36 persons/vehicle, and within Centre City the average occupancy is 1.52 persons/vehicle.

Travel Speeds

Generally, peak-period travel speeds are in the range of 10-20 mph. Travel speeds are slowest in the core area; for example, Broadway (10 mph), First Avenue (13 mph), Fifth Avenue (9 mph). Towards the margin of Centre City, travel speeds are somewhat higher; for example, A Street (19-20 mph), G Street (26 mph) and Market Street (16-19 mph). The higher travel speeds reflect signal progressions on some of the major outbound corridors from the downtown.

The primary delays for vehicles are traffic signals. Observations around Centre City indicate that while minor delays may occur due to turning vehicles and pedestrians, it is extremely rare for vehicles to wait more than one red cycle to cross any intersection within the downtown.

3. TRAFFIC CONDITIONS

An analysis of traffic volumes and roadway capacities was conducted for the Centre City cordon, which dealt with major and minor surface streets, as well as freeway ramps. For the cordon analysis, V/C rates were calculated for each segment by road type to provide an overview of the existing utilization of the roadway system[1]. These figures are summarized in Table 5. Caution should be used in interpreting these results, as they present average conditions across groups of roads. Conditions on individual roadways may be higher or lower than the average for the cordon segment as a whole.

---

[1] A capacity of 1,700 vehicles per hour of green was assumed for a through lane, and 1,500 vehicles per hour of green for a through/turn or turn lane (Level of Service E capacity).

TABLE 5. EXISTING CENTRE CITY CORDON VOLUME/CAPACITY SUMMARY

Cordon Segment	Road Type	PM Peak Hour		
		Capacity	Volume	Ratio
North-West	Major	3,080	1,930	0.63
	Minor	2,740	970	0.35
	Total	5,790	2,900	0.50
	Ramps	-	-	-
North	Major	5,265	4,020	0.76
	Minor	2,350	410	0.18
	Total	7,615	4,430	0.58
	Ramps	4,925	4,340	0.88
North-East	Major	4,740	3,140	0.66
	Minor	1,560	450	0.29
	Total	6,300	3,590	0.57
	Ramps	3,600	2,510	0.70
East	Major	9,320	3,830	0.41
	Minor	1,800	610	0.34
	Total	11,120	4,440	0.40
	Ramps	8,150	4,260	0.52
South-East	Major	1,500	690	0.46
	Minor	3,450	950	0.28
	Total	4,950	1,640	0.33
	Ramps	-	-	-
Total	Major	23,875	13,610	0.57
	Minor	11,900	3,390	0.28
	Total	35,775	17,000	0.48
	Ramps	16,675	11,110	0.67

Note: V/C ratios are for groups of roadways and ratios for individual roads within a cordon segment may be higher or lower than the average for the segment as a whole.

Freeway Ramps[1]

Current volumes for freeway on-ramps at the cordon are at approximately 67 percent of overall available capacity. Conditions vary by segment, however, with the northern cordon segments being more congested than the eastern

[1] Freeway ramp capacities are dependent on both freeway and ramp volumes, as well as physical dimensions of merge and weave areas. Ramp volume/capacity ratios are presented as planning estimates, indicative of general traffic conditions, rather than operational/engineering analyses.

cordon. Across the northern cordon, for example, the average V/C ratio for I-5 ramps is 0.88. At the north-east cordon the average is 0.70, while for the east cordon segment, the overall V/C ratio is 0.52.

Individual ramp conditions also vary considerably around these averages. The V/C ratios for I-5 ramps from First Avenue are 0.75 and 1.30 for the southbound and northbound ramps respectively. The V/C ratio for the SR-163 northbound on-ramp is about 0.85, and for the SR-94 on-ramp from G Street is about 0.91[1].

Many of the other on-ramps from Centre City operate well below capacity. The I-5 ramps on the east cordon, for example, all currently operate at about 40 percent of capacity. This is largely because there is less traffic spread over more ramps along the east cordon than along the north.

Surface Streets

Table 5 also summarizes the V/C ratios for surface streets at the cordon. The average V/C ratio for all surface streets is 0.48. However, eleven major (outbound) streets provide 67 percent of the capacity and carry 80 percent of the traffic volume, with a collective average V/C ratio of 0.57. The northern cordon, with the primary orientation to freeway access, is more heavily congested than the eastern cordon. The overall V/C ratio for the major streets on the cordon is 0.76, with First Avenue, the most heavily congested with a V/C ratio of 0.85. The general design standard for downtown is a V/C ratio of about 0.85 (or Level of Service D).

Table 6 lists the V/C ratios for major streets across the Centre City cordon. It can be seen that traffic volumes on streets crossing the northern cordon segments are typically in the range of 60-70 percent of capacity, while traffic volumes on streets crossing the eastern cordon are more typically at 40-60 percent of capacity.

---

[1] For certain periods within the peak hour, V/C ratios may be higher than these hourly averages, resulting sometimes in back-ups into the surface street system, e.g., First Avenue at I-5, G Street at SR-94.

TABLE 6. MAJOR CORDON STREET PEAK-HOUR TRAFFIC

Street at Cordon	Outbound Capacity	PM Peak Hour Volume	V/C Ratio
Harbor Drive	1,530	890	0.58
Pacific Highway	1,520	1,040	0.68
First Avenue	2,775	2,350	0.85
Fifth Avenue	2,490	1,670	0.67
A Street	2,630	1,850	0.70
Eleventh Avenue	2,110	1,290	0.61
C Street	1,880	1,060	0.56
Broadway	1,375	370	0.27
G Street	3,055	1,610	0.53
Market Street	3,010	790	0.26
Imperial Avenue	1,550	640	0.41

Finally, it should be noted that there is considerable surface capacity currently available on the minor streets which have an average V/C ratio of 0.28 across the cordon as a whole.

Centre City

Numerous previous studies of downtown have indicated little current traffic congestion at intersections within Centre City. Almost all intersections operate at Level of Service C or better during the peak hour.[1] The general low level of congestion within Centre City does not imply that traffic problems do not exist within downtown, as there are situations where some degree of traffic congestion or conflict does occur. Generally, these tend to be localized rather than areawide problems.

Local congestion spots occur, on First and Fifth Avenues for example, both of which access I-5. Traffic on First Avenue sometimes backs up from the I-5 on-ramps for up to four blocks. On Fifth Avenue, the section between Market

[1] Previous analysis indicated the only intersections operating worse than LOS C were the intersections of both Broadway and Market with Fourth, Fifth, and Sixth Avenues. A review of these analyses indicates that the level of congestion was probably overestimated at these locations, as capacity assumptions were rather low.

Street and Broadway is only two lanes, which restricts traffic flow. Local congestion sometimes occurs at Broadway due to conflicts between turning vehicles and pedestrians.

Traffic conflicts are most numerous on Broadway due to the high volume and varied nature of activity. Broadway carries high traffic volumes, is the major focus for bus routes through Centre City, and is also an area of high pedestrian activity. East of Third Avenue, there are no left-turn lanes on Broadway. The heaviest conflicts are where Broadway crosses the major north-south travel corridors of Fourth, Fifth, and Sixth Avenues, and in the area of Third Avenue adjacent to the Horton Plaza. Many transit routes stop in this area, and there is a high level of pedestrian activity that also conflicts with turning vehicles.

The discontinuity of a number of east-west streets (B, E, F Streets) in Centre City does not currently present major congestion problems, probably because of the lack of a current major demand for east-west travel west of First Avenue. Even Broadway, which is one of only two streets extending fully across Centre City, carries a high proportion of local traffic rather than traffic travelling through Centre City.

C. TRANSIT SYSTEM DESCRIPTION

Transit service into Centre City is provided by a number of different agencies. San Diego Transit (SDTC) provides 22 bus lines serving Centre City, 14 of which terminate downtown with the remaining eight routed through downtown. Three County of San Diego express bus routes also serve Centre City. The San Diego Trolley (SDTI) operates trolley service into Centre City via the South Line from San Ysidro. Strand Express operates bus service between Coronado/North Island and Centre City, Amtrak provides rail service to the Santa Fe Station, and there is a variety of jitney services that also serve Centre City.

1. TRANSIT ROUTES AND SERVICE

Table 7 lists the existing transit routes into Centre City, by operator, by their direction of entry/exit to Centre City, and the number of daily bus trips provided.

TABLE 7. EXISTING TRANSIT SERVICE TO CENTRE CITY

Route No.	Route Description	Centre City(1) Entry/Exit	Route (2) Type	Span of Service	Daily (3) Bus Trips
SAN DIEGO TRANSIT					
1	Downtown SD/49th and Adams	N	T	4:34 AM-1:14 AM	75
2	30th and Adams/SD Int. Airport	NE-E	THR	5:05 AM-12:30 AM	212
3	Mission Hills/Ocean View Blvd.	N-E	THR	5:25 AM-9:17 PM	170
4	Clairmont/Lomita Village	NW-SE	THR	5:05 AM-11:26 PM	148
5	University City/East S.D.	NW-E	THR	4:49 AM-9:23 PM	134
6	North Part/Point Loma (4)	NW	T	6:44 AM-5:75 PM	5
7	Downtown/S.D. La Mesa	NE	T	4:48 AM-12:41 PM	188
9/19	Pacific Beach/Downtown S.D.	NW	T	5:36 AM-8:31 PM	66
11	Kensington/South Spring Valley	N-SE	THR	4:24 AM-10:00 PM	164
15/115	Downtown S.D./El Cajon Pkwy Plaza	NE	T	4:34 AM-1:26 PM	121
16	College Grove/Shopping Ctr. Mission Village	N-E	THR	5:33 AM-10:37 PM	70
20	Downtown S.D./Rancho Bernardo	NE	T	5:15 AM-8:46 PM	73
25	Clairmont/Downtown S.D.	N	T	5:41 AM-8:03 PM	54
29	NTC and Sub Pier/Otay Mesa	NW-SE	THR	4:30 AM-1:53 AM	146
30	Downtown S.D./Scripps Ind. Park	N	T	5:10 AM-7:24 PM	52
34	Downtown S.D./Scripps Hospital	NW	T	5:12 AM-12:30 AM	71
35	Downtown S.D./Ocean Beach	NW	T	5:15 AM-9:55 PM	64
40	San Carlos Allied Gardens/Downtown S.D. (4)	NW-E	T	6:42 AM-5:50 PM	12
43	Allied Gardens/Downtown S.D.	NW	T	6:10 AM-9:57 PM	62
50	Downtown S.D./La Jolla Village Square	N	T	5:35 AM-6:36 PM	37
90	Downtown S.D./Parkway Plaza	E	T	5:55 AM-8:57 PM	56
110	Downtown S.D./Lomita Village	NW-E	THR	6:16 AM-6:46 PM	88

(Continued)

TABLE 7. EXISTING TRANSIT SERVICE TO CENTRE CITY (Continued)

Route No.	Route Description	Centre City(1) Entry/Exit	Route (2) Type	Span of Service	Daily (3) Bus Trips
STRAND EXPRESS					
	Downtown S.D./Coronado	SE	T	5:20 AM-2:01 AM	71
SAN DIEGO COUNTY					
800	Oceanside/S.D. Express	N	T	6:10 AM-6:25 PM	6
810	Escondido/S.D. Express	NE	T	6:45 AM-6:15 PM	4
820	Poway-S.D./Express	NE	T	6:35 AM-6:00 PM	4
SAN DIEGO TROLLEY					
	San Ysidro/Santa Fe Depot	SE	T	5:41 AM-1:41 AM	304

Notes: (1) Cordon segment of route entry/exit.

(2) T = terminates in Centre City; THR = Service thru Centre City.

(3) Both directions. For routes thru Centre City, includes trips into/out of Centre City from both approaches.

(4) Peak Trip per service only.

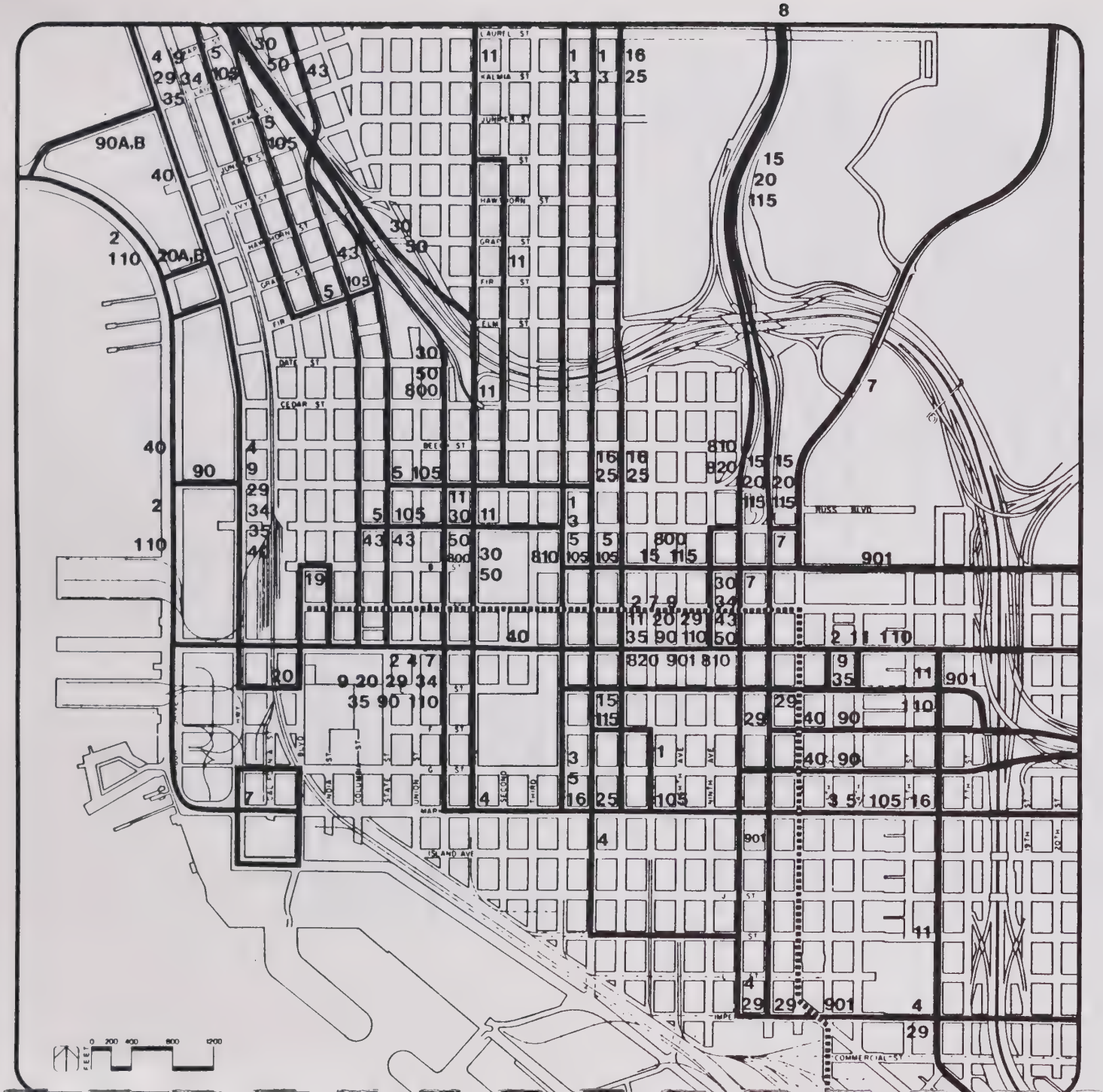
Figure 9 illustrates the location of these routes within Centre City. In most cases midday frequencies are about 30 minutes, while evening peak-hour frequencies are generally in the 10-15 minute range.

Transit service into Centre City uses the major approach corridors defined earlier, mainly Harbor Drive/Pacific Highway, Front Street/First Avenue, Fourth/Fifth/Sixth Avenues, Tenth/Eleventh Avenues, and Broadway, F/G Streets, Market Street, and Logan Avenue/National Avenue. Bus routes are focused heavily along Broadway, with some service using Ash Street/A Street, B Street, as well as F/G Streets, Market Street, and Island Avenue. Broadway carries the heaviest bus vehicle volumes of all downtown streets, with just under 1,000 bus trips per day (two-directional) and 75 bus trips during the peak hour, in the section between First and Fourth Avenues. The concentration of transit service on Broadway is restricted to the core area, however, as there are only about 190 bus trips daily on Broadway on the eastern margin of Centre City at 16th Street.

Other streets carrying high bus vehicle volumes are Harbor Drive (194 daily bus trips), Pacific Highway (382 trips), Tenth Avenue (230 trips), Eleventh Avenue (270 trips), Market Street (187 trips daily), Fourth Avenue (175 trips) and Fifth Avenue (153 trips). With the exception of Broadway, bus vehicle trip volumes during the peak hour typically range between 10-20 bus trips on the major transit travel routes described above.

2. TRANSIT PASSENGER VOLUMES

A total of almost 57,000 transit passengers are carried across the Centre City cordon each day by the various transit operators. Table 8 summarizes these flows by operator. Almost 75 percent of transit passengers traveling into Centre City travel by San Diego Transit bus routes, for a daily total of 41,850 passengers. A further 19 percent of transit passengers into Centre City ride the trolley. The other transit modes into Centre City (Strand Express, County Transit, Amtrak, and the jitney services), together account for about 7.5 percent of all transit trips into Centre City.



CENTRE CITY Transportation Action Program

Legend:

- BUS ROUTES
- TROLLEY

FIGURE 9
EXISTING TRANSIT ROUTES

PRC Engineering, Inc.

TABLE 8. DAILY TRANSIT PASSENGERS AND VEHICLES CROSSING THE CENTRE CITY CORDON

Transit Operator	Passengers				Daily Buses/ Train Cars
	Inbound	Outbound	Total	%	
San Diego Transit Corp. (SDTC)	20,300	21,550	41,850	73.5	1,960
San Diego Trolley, Inc. (SDTI)	5,775	4,900	10,675	19.0	304
Strand Express	750	750	1,500	2.5	70
County Transit System Express	150	150	300	0.5	14
Amtrak	265	325	590	1.0	70
Jitney	1,000	1,000	2,000	3.5	314
TOTAL	28,240	28,675	56,915	100.0	2,732

The distribution of transit passenger trips into Centre City is fairly evenly divided across the five segments of the Centre City corridor, as illustrated in Table 9. Approximately one-half of transit trips crossing the Centre City cordon approach from the north, and one-half from the east/southeast. The highest proportion of passengers (32 percent) approaches from the south-east, reflecting the trolley ridership. Otherwise, between 15 percent and 20 percent of passengers cross the cordon by each of the northwest, north, and northeast segments.

The highest volume transit lines are the San Diego trolley (10,675 daily riders), and San Diego Transit bus route 7 (6,105 daily riders). Other high volume lines are San Diego Transit bus routes 2, 3, 4, 5, 11, 15/115, 20, 29 and 34. Together, these eleven transit routes carry over 55 percent of the daily transit passengers load into Centre City. There are a total of about 12,000 daily bus transfers between bus lines serving Centre City, although not all of these transfers necessarily occur within Centre City.

TABLE 9. DAILY TRANSIT PASSENGERS CROSSING THE CORDON - BY SEGMENT

Cordon Segment	Daily Buses/ Trains	% of Total	Daily Passenger Volume	% of Total
North-West	495	21%	9,800	15%
North	425	18%	8,100	15%
North-East	495	21%	10,550	19%
East	390	16%	8,375	15%
South-East	603	25%	17,500	32%
Total	2,408		54,325	

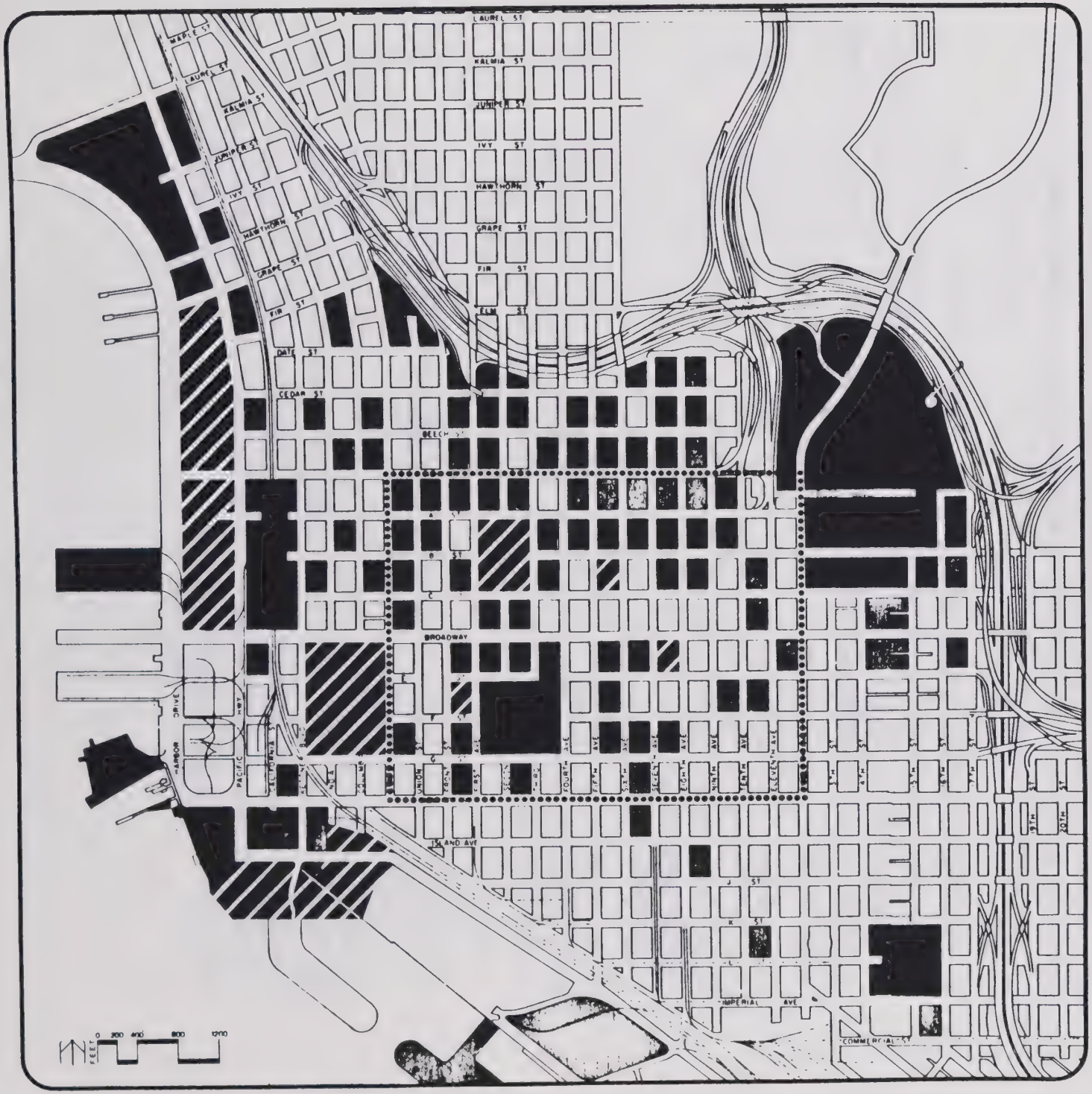
Note: Excludes Amtrak and Jitney services.

D. PARKING

1. PARKING SUPPLY

Currently, there are a total of 40,160 parking spaces in Centre City. Almost 40 percent, about 15,600 spaces, are within the Central Area (bounded by Ash Street, Twelfth Avenue, Market Street, and State Street). The remaining 60 percent of spaces, or about 24,560, are located outside of the Central Area. For Centre City as a whole, about 26 percent or 10,390 spaces are on-street parking, with the remaining 74 percent or 29,770 spaces being off-street. Within the Central Area, only 13 percent (1,970 spaces) are on street, while outside the Central Area 34 percent (8,420 spaces) are on-street.

Figure 10 illustrates the distribution of parking spaces across Centre City. About 33 percent of all spaces are located north of A Street, with 61 percent of all spaces north of Broadway. About 22 percent of Centre City parking spaces are located south of Market Street. Almost 44 percent of Centre City spaces are located between A Street and Market Street, although a large part of these are at the western and eastern margins of Centre City. For example, 11 percent of all spaces in Centre City are located west of Pacific Highway.



CENTRE CITY
Transportation Action Program

Legend:

- <50 SPACES
- 50-100 SPACES
- 101-200 SPACES
- 201-500 SPACES
- >500 SPACES
- ..... CENTRAL AREA

NOTE: ALL SPACES, ON-STREET AND OFF-STREET, INCLUDED.

SOURCE: SANDAG PARKING INVENTORY (1984 CENTRAL AREA, 1981 OUTSIDE CENTRAL AREA)

FIGURE 10
EXISTING PARKING SUPPLY

prc
PRC Engineering, Inc.

2. ON-STREET PARKING

Table 10 summarizes a breakdown of the supply and usage of parking within Centre City. Over 80 percent of on-street parking is located outside the Central Area, with only 1,970 on-street spaces being located within the Central Area core. Within the Central Area, 68 percent of the on-street spaces are metered, the majority having a 2-3 hour time limit. Outside of the Central Area, only 34 percent of spaces are metered. The average occupancy for on-street spaces in Centre City as a whole is 77 percent, and for the Central Area is 81 percent. As the practical capacity of short term parking is normally considered to be about 85 percent occupancy, it may be concluded that the on-street parking supply is currently close to capacity.

TABLE 10. PARKING SUPPLY AND USAGE IN CENTRE CITY

Parking Type	Centre City Spaces	Centre City % Occupancy	Central Area Spaces	Central Area % Occupancy	Other Spaces	Other % Occupancy
On-Street						
Metered	3,555	62	1,345	79	2,210	51
Unmetered	6,493	86	472	91	6,021	86
Total	10,391	77	1,971	81	8,420	76
Off-Street Structure						
Private	1,899	72	1,601	72	298	69
Public	7,025	78	6,338	79	687	63
Customer	803	46	263	42	840	48
Total	9,727	74	8,202	77	1,525	59
Lot						
Private	7,969	71	1,662	76	6,307	70
Public	8,055	77	3,094	83	4,961	73
Customer	4,018	46	673	58	3,345	43
Total	20,042	68	5,429	78	14,613	65
Total	29,769	70	13,631	77	16,138	64
TOTAL	40,160	72	15,602	78	24,558	68

Source: SANDAG Parking Inventory 1984. (Occupancy information collected throughout the day; does not represent a specific time.)

3. OFF-STREET PARKING

Off-street parking constitutes 87 percent of the supply in the Central Area, and 74 percent of the overall Centre City Supply. In total, 33 percent of off-street spaces are in parking structures, and the remaining 67 percent are in surface lots. However, the structure spaces are heavily concentrated in the core area with 84 percent of all structure spaces in Centre City located within the Central Area. Within the Central Area, 60 percent of the parking supply is in structures and 40 percent in surface lots. Outside it, the majority of the supply (91 percent) is in surface lots with only 9 percent in structures. Structure and surface lot parking breaks down to three principal types - private (employee only), public, and customer parking.

Almost 75 percent of structure parking is for public use, about 20 percent is for private employee parking, with a negligible amount of customer only parking, particularly in the Central Area. The average occupancy for structure spaces in Centre City is 72 percent for private parking and 78 percent for public parking. The small amount of customer parking in structures averages about 45 percent occupancy.

The majority of surface lot parking is for private and/or customer use. About 40 percent of surface lot parking is public, 40 percent private, and 20 percent for customer use only. Occupancy levels for surface lot parking are very similar to those for structure parking within the Central Area. The average occupancy is 76 percent for private spaces and 83 percent for public spaces. Occupancy levels are only slightly lower outside of the Central Area, at 70 percent in private lots and 73 percent in public lots.

4. USAGE SUMMARY & PARKING COSTS

For the Central Area, the average occupancy is 81 percent for on-street spaces, and 77 percent for off-street spaces. For Centre City as a whole, average occupancy is 76 percent and 69 percent, respectively. The available occupancy data were collected throughout the day. Thus, the peak occupancy may be higher than these figures. The analysis indicates that while there is probably some

current spare parking capacity in Centre City, generally, the parking supply is close to being fully utilized, particularly in the Central Area.

The principal sources of information for parking costs in Centre City are the 1981 SANDAG Parking Inventory and general field observations. The Inventory identified the average daily cost as $2.46 for Centre City as a whole, and $3.12 for the Central Area. The most expensive parking areas are the structures in the Central Area where current charges range up to 85-90¢ per half-hour or a $5-$6 a day maximum. Less expensive parking is found outside of the Central Area, for example surface lots to the west and north of the core, where $2.00 daily charges are currently typical. In 1983 the San Diego Chamber of Commerce identified prevailing monthly parking rates as $30-$40/month in peripheral lots, and $60-$70/month in major core structures.

E. SUMMARY OF EXISTING CONDITIONS

1. TRAVEL VOLUME INTO CENTRE CITY

A total of 286,000 daily vehicle trips occur across the Centre City cordon. With an average vehicle occupancy of 1.38, automobile person trips across the cordon total about 389,000 daily. There are a further 57,000 daily passenger trips by transit across the cordon. Therefore, a total of approximately 446,000 person trips cross the cordon into Centre City each day, of which 12.5 percent are by transit. While virtually all of the auto trips are actually destined for Centre City, many of the transit trips are trips passing through downtown, either on direct transit service or transferring between bus routes. Best available estimates indicate that 5-8 percent of trips destined to downtown on a daily basis use transit.

2. CENTRE CITY ACCESS

Access to Centre City is predominantly by the three major freeways and is heavily oriented to the I-5 and SR-163 ramps on the north side of Centre City. The following key conclusions were drawn from the analysis:

- Many of the key freeway ramps, primarily those to I-5 between Front and Sixth Avenues, the SR-163 and SR-94 ramps, are currently operating close to or at capacity during the peak period.

- Of the 23 freeway ramps serving Centre City, 10 ramps carry 70 percent of the total traffic volume. There is a lack of direct freeway access to the west side of Centre City. Access currently is off I-5 at Sassafras/Washington (considerably north of Centre City) and via the Kettner Blvd/India Street couplet, or via the much more direct and preferred Front Street/First Avenue ramps.

- There is also a lack of direct freeway interchange from SR-163 southbound to SR-94 eastbound, and between SR-94 and I-5 (both west-south and north-east).

3. CENTRE CITY TRANSPORTATION SYSTEM

The following conclusions were drawn from the analysis of current conditions for the Centre City Transportation System:

- There are 35 surface streets providing access to Centre City, although 80 percent of traffic volumes are accounted for by only eighteen of these streets.

- The limited number of streets connecting across Centre City has the effect of focusing traffic into a few principal travel corridors. Route choices are generally restricted.

- On the major roadways in/out of Centre City, traffic volumes are currently on average at about 60 percent of roadway capacity. Volumes are closer to capacity on streets in the north of Centre City than streets in the east. Traffic volumes on First Avenue are currently at the design capacity (V/C ratio of 0.85). Volumes on other major streets (Harbor, Pacific, Fifth, A, Eleventh) across the northern cordon are in the range of 60-70 percent of capacity. On

the eastern cordon there is rather more surplus capacity, with traffic volumes on major streets (C, G, Broadway, Market) in the range of 30-55 percent of capacity. There is considerable surplus capacity on the minor roadways feeding downtown. However, the usefulness of any spare capacity on the surface system is limited, particularly on the north side of town, as the freeway access is the real constraint and many of the key ramps are at or approaching capacity.

- Traffic volumes are highest in the more densely developed area north of Market Street.

- An analysis of volume/capacity conditions and travel speeds within Centre City indicates generally low levels of traffic congestion on Centre City roadways. Traffic volumes in general are below roadway capacities and traffic congestion is limited to a few localized areas.

- Traffic flow on certain north-south streets is heavy, and local congestion spots occur, on First and Fifth Avenues for example, both of which access I-5. Traffic on First Avenue sometimes backs up from the I-5 on-ramps. On Fifth Avenue, local congestion sometimes occurs on the two-lane section at Broadway due to conflicts between turning vehicles and pedestrians.

- There is a significant level of transit usage both to and through Centre City. A high volume of transit transfers occurs in downtown, due largely to the radial nature of the bus system.

- Traffic conflicts are most numerous on Broadway due to the high traffic volumes, since it is a major focus for bus routes through Centre City, as well as an area of high pedestrian activity. The heaviest conflicts are where Broadway crosses the major north-south travel corridor of Fourth, Fifth, and Sixth Avenues, and in the area of Third Avenue adjacent to the Horton Plaza. Many transit routes stop in this area, and there is a high level of pedestrian activity that also conflicts with turning vehicles.

- The discontinuity of a number of east-west streets (B, E, F Streets) in Centre City does not currently present major congestion problems probably because of the lack of a current major demand for east-west travel west of First Avenue. This may become a more significant problem in the future as land use density increases west of Front/First Avenue.

- Transit routing options through Centre City are limited, due primarily to the extensive one-way street patterns, the high number of closed (discontinuous) streets, and severe grades in the northeast quadrant of Centre City.

- There are currently 40,200 parking spaces in Centre City, of which 10,400 are on-street and 29,800 are off-street. The analysis indicated that while there is some current spare parking capacity, in general the parking supply is close to being fully utilized, particularly in the Central Area.

II.
LAND USE ANALYSIS

A. EXISTING CONDITIONS

As part of the task of analyzing existing conditions, a land use inventory data base was developed on a block-by-block basis for Centre City. In the preparation of the inventory, land use amounts were defined by a number of key land use types, for each block in the downtown. The number of employees and residents in downtown were then estimated through the application of employee density and household size factors.

The existing land use data was assembled from a variety of sources, including the following agencies: City of San Diego Planning Department; Centre City Development Corporation; San Diego Unified Port District; Metropolitan Transit Development Board; Greater San Diego Chamber of Commerce.

The research data was supplemented by field checks, a current aerial photograph, and timely public announcements of specific private projects. The land uses were categorized as shown in Table 11 and summarized by individual block. For each of the 350 blocks in the Centre City, the gross square footage (GSF), hotel rooms, students, or dwelling units were recorded. The approximate numbers of people employed or living in Centre City were also estimated for input to the transportation analysis. The conversion factors (which were compiled from several current sources) and the estimated person totals are also shown in Table 11.

There are currently about 22 million GSF of all types of building space in Centre City, a total of almost 68,000 employees, and a resident population of about 6,300. Of the employee totals, a large number are associated with the office and government land uses in Centre City.

Figure 11 summarizes the population and employment levels by the fourteen major districts within Centre City (these are the same as the fourteen downtown

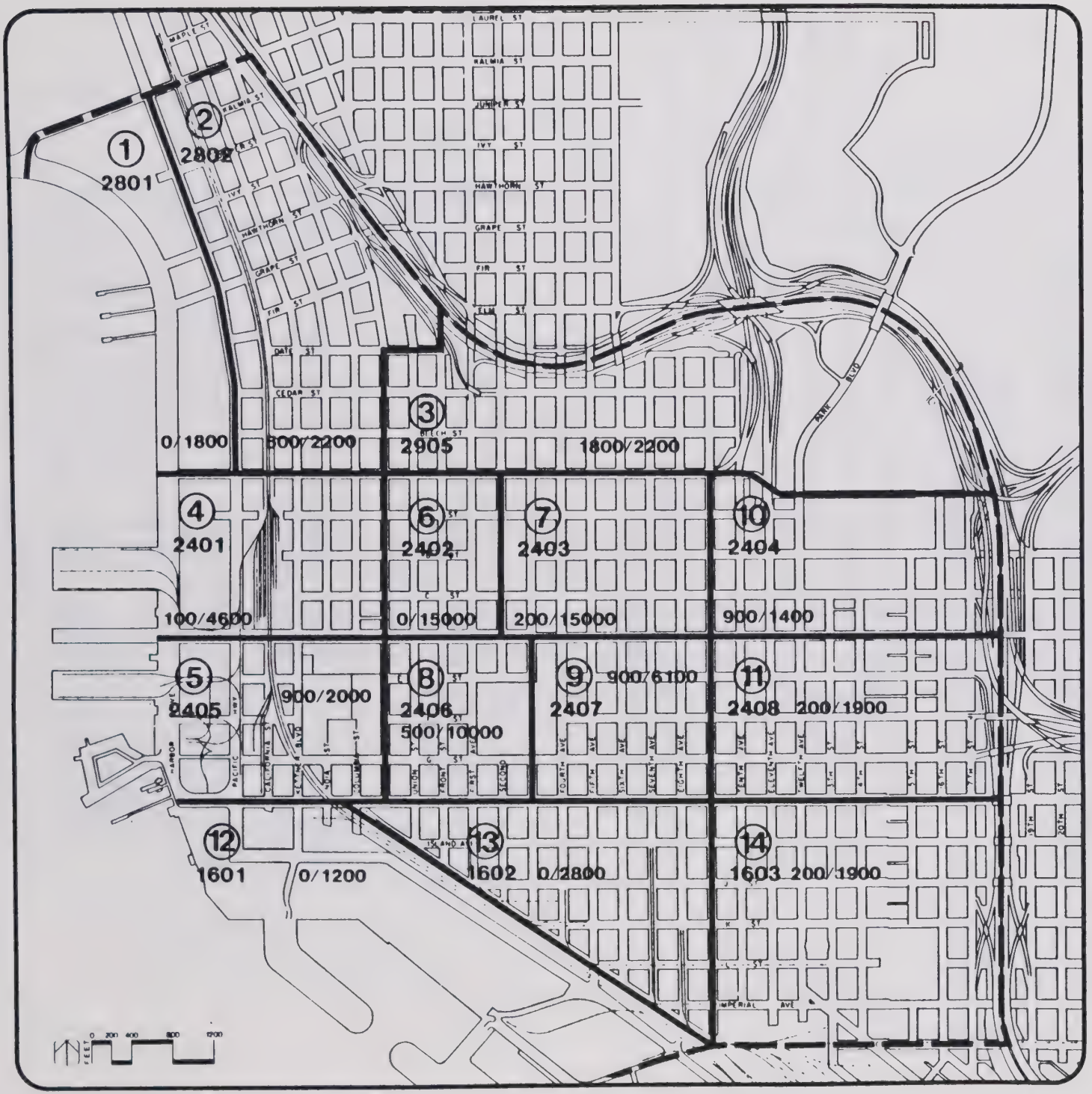
TABLE 11. EXISTING LAND USE SUMMARY

Land Use Category	Units	Amount	Person[1] Density	Total Persons or Employees
OFFICE	GSF	7,733,900	1/225	34,373
HOTEL	rooms	2,674	0.8/1	2,140
RETAIL	GSF	(3,536,800)	1/350	(10,118)
Restaurant		148,600	1/150	990
General		2,405,000	1/370	6,500
Specialty		567,200	1/300	1,891
Regional		230,000	1/635	362
Other		186,000	1/500	375
GOVERNMENT	GSF	2,669,900	1/200	13,350
CULT./INST.	GSF	754,000	1/4000	190
EDUCATION	students	10,301	1/20[1]	515
RESIDENTIAL	D.U.	4,153	1.5/1	6,230[2]
INDUSTRIAL	GSF	4,501,500	1/1000	4,501
OTHER				
Military	GSF	1,683,000	1/1000	1,685
Other	GSF	833,900	variable	550

TOTALS		
	Gross Square Feet	21,713,000
	Employees	67,802
	Population	6,230
	Students	10,301

1) Education expressed in employees per number of students.

2) Residential population not included in employee total.



CENTRE CITY
Transportation Action Program

Legend:

(X) - DISTRICT NUMBER

XXXX - SANDAG TAZ NUMBER

XXX/XXXX - EMPLOYEES / RESIDENTS

SOURCE: PRC ENGINEERING 1984 LAND USE INVENTORY

FIGURE 11
EXISTING POPULATION AND EMPLOYMENT IN CENTRE CITY

prc
PRC Engineering, Inc.

transportation analysis zones used in the SANDAG regional model). About two-thirds of current employment in Centre City is in the four districts which largely comprise the CBD core (Districts 6-9). The remaining employment in Centre City is fairly evenly distributed across the other areas in Centre City, with a slight emphasis to the western and southern margins.

B. FUTURE LAND USE OVERVIEW

Three alternative future development levels were identified for Centre City for use in the evaluation of future transportation needs, as follows:

Level 1 - Existing Plus Committed Projects
Level 2 - Optimum Employment Land Use
Level 3 - Optimum Residential Land Use

These three scenarios were identified as representing a significant range of potential development scenarios. The Level 1 scenario relates to a mid-range projection primarily based upon known and committed projects. Hence, it is highly probable that Level 1 development will be reached. The Level 2 and Level 3 scenarios relate to a longer range time horizon; therefore, they are more speculative. Level 2 comprised optimistic assumptions regarding employment growth in Centre City. Level 3 assumed less employment growth and comprised a maximum residential growth scenario.

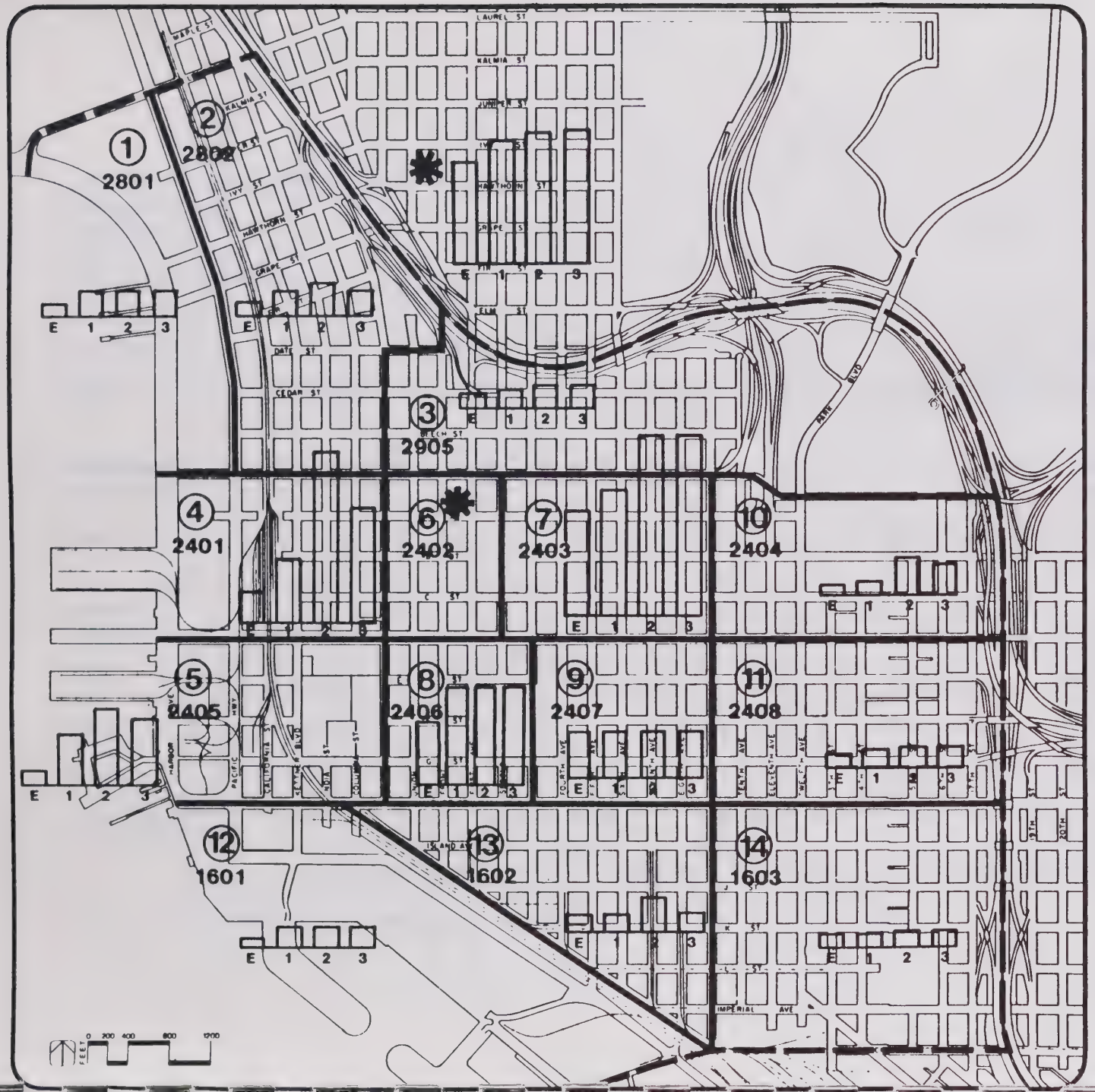
The land use scenario projections are summarized in Table 12. Existing gross square footage of building space downtown would increase from the existing level of almost 22 million GSF to about 28 million by Level 1, 34.5 million for Level 2, and 32 million for Level 3. The increases would take place largely due to projected office developments in Centre City. The number of employees would increase from the existing total of 67,800 to 94,300 for Level 1, 131,500 for Level 2, and 117,300 for Level 3. By comparison, residential population increases would be significantly less, from today's total of 6,200 residents, to 9,300 for Level 1, 11,200 for Level 2, and 13,700 for Level 3.

Figures 12 and 13 show the distribution assumptions for these growth levels across Centre City for employment and population, respectively. The main areas of

TABLE 12. SUMMARY OF LAND USE PROJECTIONS

CATEGORY	Existing Conditions April 1984 GSF	Existing Conditions April 1984 Employees	Existing Plus Committed Level 1 GSF	Existing Plus Committed Level 1 Employees	Optimum Employment Level 2 GSF	Optimum Employment Level 2 Employees	Optimum Residential Level 3 GSF	Optimum Residential Level 3 Employees
Office	7,733,900	34,373	11,218,655	49,861	18,258,190	81,148	16,058,190	71,370
Hotel	2,674[1]	2,140	6,798[1]	5,438	12,698[1]	10,158[1]	7,698	6,158
Retail	3,536,800	10,118	4,810,800	13,745	5,010,800	14,317	4,849,800	13,857
Government and Cultural/ Institutional	3,423,900 750,000	13,540	4,221,900	17,530	4,221,900	17,530	4,221,900	17,530
Industrial	4,501,400	4,501	4,501,400	4,501	5,007,400	5,007	5,007,400	5,007
Educational	10,301[2]	515[4]	10,301[2]	515[4]	12,301[2]	615[4]	12,301[2]	615[4]
Residential	4,153[3]	6,230[4]	6,203[3]	9,305[4]	7,453[3]	11,180[4]	9,153[3]	13,730[4]
Other	2,176,900	2,615	3,016,900	2,713	3,166,900	2,743	3,166,900	2,743
TOTALS	21,713,000	67,802	27,769,655	94,303	34,521,835	131,518	32,160,835	117,280

GSF = gross square feet
1 Rooms
2 Students
3 Dwelling Units
4 Population - not included in employee total



CENTRE CITY Transportation Action Program

Legend:

30000
25000
20000
15000
10000
5000
0

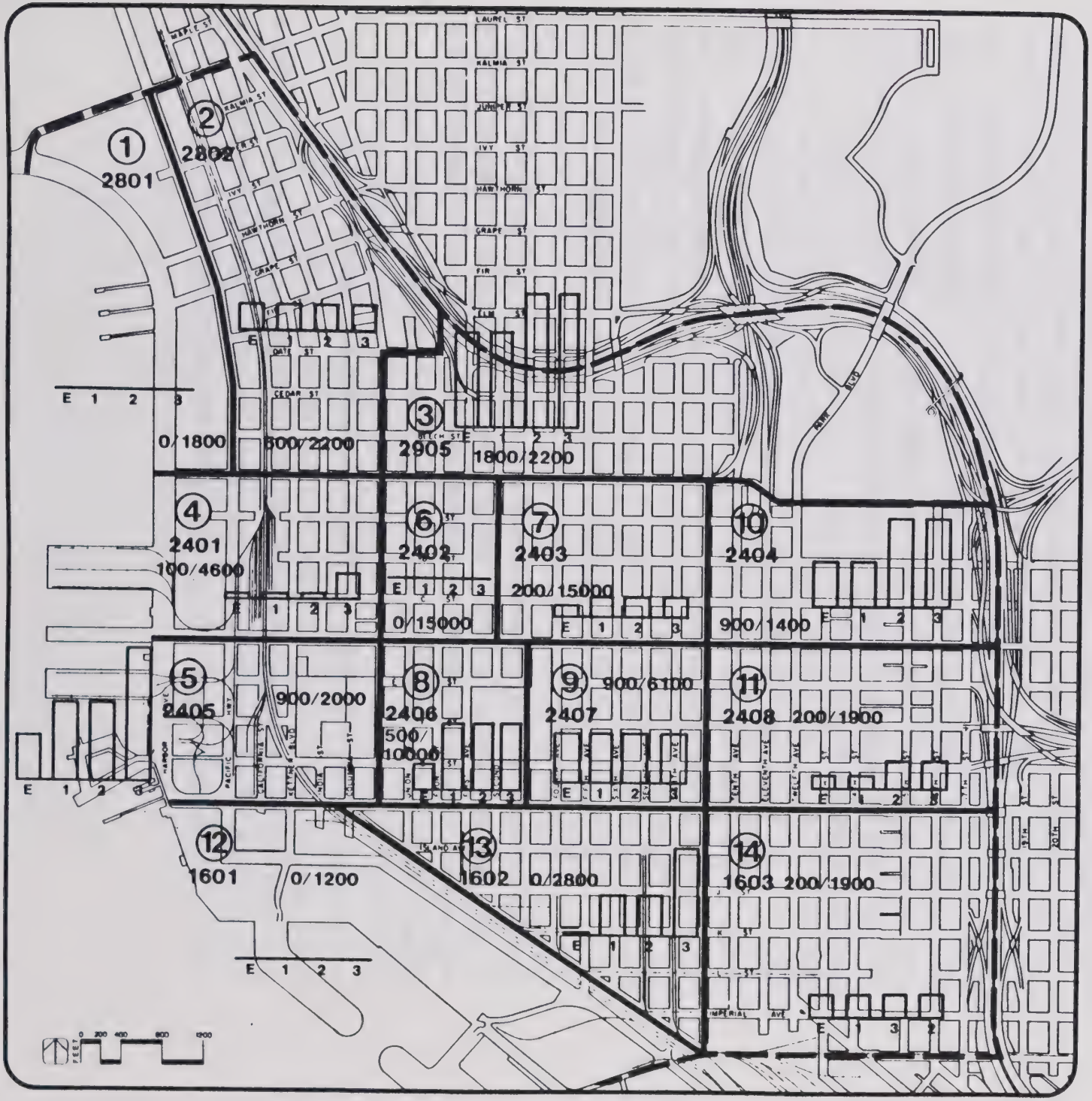
E=EXISTING
1=LEVEL 1
2=LEVEL 2
3=LEVEL 3

(X)-DISTRICT NUMBER

XXXX-SANDAG TAZ NUMBER

FIGURE 12
EMPLOYMENT GROWTH ASSUMPTIONS BY CENTRE CITY DISTRICT

prc
PRC Engineering, Inc.



CENTRE CITY
Transportation Action Program

Legend:

3000
2500
2000
1500
1000
500
0

E=EXISTING
1=LEVEL 1
2=LEVEL 2
3=LEVEL 3

FIGURE 13
POPULATION GROWTH ASSUMPTIONS BY CENTRE CITY DISTRICT

prc
PRC Engineering, Inc.

employment growth are projected to be in the existing core area (Districts 6 through 9 on the map), and in the area to the west of the existing core (Districts 4 and 5 on the map) bounded by Ash, State, Market, and Harbor Drive. Principal areas of population growth are projected to be in the waterfront areas west and south of the existing core, as well as to the north of Ash. Very little growth activity is projected to occur in the eastern part of Centre City in any of the three development levels.

C. LEVEL 1 SCENARIO - EXISTING PLUS COMMITTED PROJECTS

This projection constitutes the mid-range expectation of growth in Centre City because it adds to existing conditions only those projects under construction or having received some form of governmental approval. With the exception of the Santa Fe Railroad properties, the office, hotel and retail components of the various mixed-use projects are included as currently planned. Because of the 25-year period of the Santa Fe Development Agreement with the City of San Diego, only the first phase is included in Level 1.

In summary, this projection would add more than 2 million square feet of office space, about 4,100 hotel rooms, more than 1 million square feet of retail space, major additions to government facilities, and 2,000 new residential units in the Marina area. The initial phase of the proposed Convention Center (500,000 square feet) is also included. Employment in Centre City would increase from 67,000 to nearly 95,000, or about 42 percent. Most of the new development would occur in the Business Core (Horton Plaza), the Columbia, and the Marina areas, which demonstrates the attractive qualities of the San Diego Bay waterfront. The specific projects, by name or block number, included in the Level 1 development scenario, as well as the block numbering system used in the analysis, are detailed in Appendix B.

D. LEVEL 2 SCENARIO - OPTIMUM EMPLOYMENT LAND USE

This projection is intended to describe a highly optimistic expectation of growth in Centre City by assuming a sustained annual absorption rate of nearly 450,000 GSF of office space, and a very substantial increase in new hotel rooms related to the

new convention center. Employment in this alternative would increase from about 67,000 to more than 130,000 by the year 2005, an approximate 93 percent increase, or an average 3.1 percent compounded annual growth rate.

The Level 2 scenario assumes that the Santa Fe project would be built to the maximum intensity permitted by their Development Agreement with the City of San Diego, and that other announced projects would be built as planned. In addition, several more major office projects were assumed. (See Appendix B for location details.) Level 2 also assumed at least three more major hotel projects to be built in relation to the new convention center, with a total addition of 5,000 rooms.

In summary, this projection would more than double the amount of existing office space, adding nearly 9,000,000 GSF during the next 20 years. Hotel rooms would more than triple, by adding 10,000 rooms to the present inventory in Centre City. Retail space would increase by the 200,000 GSF planned for the Santa Fe properties, and residential uses would be increased by 1,250 dwelling units on the assumed blocks identified by number. The convention center would receive the planned additional 150,000 GSF, enrollment at San Diego City College would increase by about 2,000 students, and about 500,000 GSF of industrial uses would be added in the South College area. Specific project assumptions are identified in Appendix B.

E. LEVEL 3 SCENARIO - OPTIMUM RESIDENTIAL LAND USE

This alternative projection to the year 2005 is intended to show the maximum degree of residential development, and to provide a less optimistic view of employment growth than the Level 2 scenario. In the absence of any significant anticipated government assistance programs, the realistic prospects for substantial residential projects appear to be rather limited. Therefore, Level 3 assumes that the Marina redevelopment area would be built out with a maximum of 3,100 dwelling units, and an additional 600 dwelling units would be built in the Columbia area, probably as part of one or more mixed-use developments. The assumption of additional concentrations of housing development on Cortez Hill and in the City College area contained in Level 2 are also included, for a total net addition of more than 5,000 dwelling units.

To accommodate the additional dwelling units in the Marina area, the 5,000 hotel rooms contained in the Level 2 scenario were deleted, and the projected growth in office space was reduced to less than 7,000,000 square feet, or an 87 percent increase. Retail growth was reduced to the modest addition shown for the Santa Fe properties, and the other land use categories were maintained as shown for the Level 2 scenario. This projection is summarized specifically in Appendix B.

F. SUMMARY

The three alternative Land Use Scenarios were prepared for the purposes of evaluating the deficiencies of existing transportation systems under future conditions and to prepare future policies and a phased action program to accommodate the future growth of Centre City. The Land Use Scenarios are intended for transportation planning purposes and not as any official amendment to the adopted Centre City Community Plan, or any official land use policy.

The actual development patterns in future years will depend upon a variety of market and economic conditions, both within and external to Centre City. However, the value of these assumed projections is to provide an adequate level of specificity for the travel forecasting process and evaluation of future transportation conditions.

III.
FUTURE SYSTEM DEFICIENCIES

This chapter documents the forecasting of future travel demands for the three land use development scenarios defined for Centre City (Levels 1, 2, and 3), along with an evaluation of the magnitude and locations of future transportation system deficiencies that would occur under each of the three land use levels.

It should be noted that the land use levels assumed for this analysis of potential future transportation system deficiencies are not official forecasts but a range of scenarios defined for the purposes of testing.

A. BACKGROUND TO TRAVEL FORECASTS

1. SOCIOECONOMIC INPUTS

Table 13 summarizes the key parameters of each of the three land use scenarios assumed for the travel forecasts. For the Level 1 Scenario (Existing Plus Committed), building space in Centre City would increase from today's level of about 21.7 million GSF (gross square feet) to almost 28 million GSF, with the number of employees working in Centre City increasing by about 40 percent from 67,800 to 94,300.

Under the Level 2 Scenario (Optimum Employment), downtown building space would increase to about 34.5 million GSF, and downtown employment would increase by 95 percent over today's levels to about 132,000 employees.

The Level 3 Scenario (Optimum Residential) defines lower development than Level 2, with about 32.2 million GSF of building space and 117,000 employees. This scenario also defines a 120 percent increase in residential population in Centre City, from 6,250 persons today, up to almost 14,000 persons in the future.

TABLE 13. SUMMARY OF FUTURE DEVELOPMENT LEVEL ASSUMPTIONS

Scenario	GSF	Employees	DU's	Population
Existing	21,715,000	67,800	4,150	6,250
Level 1	27,770,000	94,300 (+39%)	6,200	9,300 (+49%)
Level 2	34,522,000	131,500 (+94%)	7,450	11,200 (+79%)
Level 3	32,160,800	117,300 (+73%)	9,150	13,750 (+120%)

Note: 1. GSF = gross square feet.
2. Figures in parentheses show percent increase over existing case.

The main areas of employment growth are projected to be in the existing core area and in the area to the west of the existing core bounded by Ash, State, Market and Harbor Drive. Principal areas of population growth are projected to be in the waterfront areas west and south of the existing core, as well as to the north of Ash. Very little growth activity is projected to occur in the eastern part of Centre City in any of the three development levels.

Outside of the Centre City study area, regional socioeconomics from Series VI (SANDAG) were used for travel forecasting purposes. The 1990 regional socioeconomic forecasts were input for the Level 1 analysis and the 2005 regional socioeconomic forecasts for the Level 2 and Level 3 analysis.

2. TRANSPORTATION SYSTEM CHARACTERISTICS

The analysis of future problems comprised the loading of future travel demand forecasts onto the existing transportation system to evaluate potential deficiencies. The "existing" transportation system is defined as what is in place currently, plus committed projects. As certain system changes and improvements are already planned for the future, it was necessary to include them in this

analysis. The Preferred Street System for Centre City and the Regional Transportation Plan were used as a guide for future projects to be included in the analysis.

Table 14 summarizes the assumed changes in the highway system. These changes were assumed for all three land use levels. For the purposes of this analysis, it was assumed that C Street would remain open.

TABLE 14. HIGHWAY SYSTEM CHANGES ASSUMED FOR TASK 4 ANALYSIS

Roadway	Location	Improvement
Kettner Boulevard	A Street - Broadway	Change to 2-way
13th Street	C Street - National	Change to 1-way SB
14th Street	C Street - National	Change to 1-way NB
SR 163	I-5/SR 94	Direct connection from SB SR 163 to EB SR 94
I-5	Pacific Highway - Front/2nd	SB auxiliary lane and widen off-ramps
I-5	First Avenue - Pacific Highway	NB auxiliary lane
I-5	Old Town - Kettner Boulevard	SB auxiliary lane and widen Kettner off-ramp
I-5	SR 163 - SR 94	SB auxiliary lane
I-5	Imperial - SR 163	NB auxiliary lane

Source: Centre City Preferred Street System; Caltrans.

The levels of transit service for Centre City defined in the Regional Transportation Plan[1] were assumed for the analysis of future system deficiencies. For the Level 1 analysis, the East Urban and Airport LRT lines were assumed to be in place, along with HOV/Bus Lanes in the I-15 corridor. For the Level 2 and Level 3 analyses, the full LRT system specified in the RTP by 2005 was assumed, including the East Side, Airport, Oceanside/Escondido, and Mission Valley LRT lines, and HOV/Busway in the I-15 corridor.

3. TRAVEL FORECASTING METHODOLOGY

The travel forecasting process developed for the CCTAP utilizes both the SANDAG regional travel model, and PRC Engineering's microcomputer-based MicroTRIPS transportation planning software package.

Trips associated with Centre City are very largely trips that are attracted there from other parts of the metropolitan/county area. The SANDAG regional model has already been developed for the very purpose of forecasting regional travel movements, has been calibrated with special CBD parameters and relationships, and provides good overall forecasts of travel to/from Centre City. It is sensitive to regional land use patterns and changes, as well as to the regional transportation networks, and is thus ideally suited to forecasting travel demand into/out of Centre City.

The SANDAG model covers the majority of San Diego County and is oriented toward metropolitan area-wide impacts and needs. There are over 700 traffic analysis zones (TAZ's) in the SANDAG model, for the entire region. Not surprisingly, the SANDAG model lacks detail in Centre City, both in street network and zone system detail. For the area of Centre City there are only 14 TAZ's in the SANDAG model.

The CCTAP thus developed a process of taking SANDAG's regional trip tables and converting them to an appropriate level of detail for Centre City, and then

---

[1] Regional Transportation Plan, January 1984, San Diego Association of Governments.

assigning them to a more detailed transportation network. The resultant process combines the best available techniques for regional travel forecasts, with the ability to apply those forecasts at a considerable level of detail within Centre City.

For the CCTAP it was necessary to convert SANDAG's zone system to a system more appropriate for the detailed study of Centre City. This involved aggregating zones outside Centre City where less detail is required, and disaggregating Centre City zones to allow more detailed analysis. The CCTAP TAZ System totals 160 zones, with 100 zones in the Centre City study area, and 60 zones outside Centre City. During the study, only 95 Centre City zones were assigned, leaving five zones free for future assignment if additional zones are needed.

The trip tables conversation process essentially disaggregates the 14 Centre City zones in the SANDAG model, to a 95 zone system for Centre City in the CCTAP model, prior to assigning trips to the CCTAP network. The disaggregation is executed on the basis of parking supply in each of the CCTAP zones, rather than land use or building characteristics, due to the fact that in CBD's, unlike other urban and suburban areas, people do not necessarily park in the same block as the building in which they work or shop, but often have to walk from parking place to destination.

The development of travel demand forecasts, in trip table format of trips between zones, utilizes the SANDAG modelling process. The basic steps are:

1. Prepare land use data by zone.
2. Trip generation (production/attractions by zone).
3. Trip distribution (zone-zone trip tables).
4. Modal split.
5. Convert trip tables for CCTAP process.

Based on specific Centre City land use data, the SANDAG model provides travel forecasts compressed to the 160 CCTAP zones for the following trip purpose and modal breakdown:

o Work	by	o Auto Driver
o Non-Work		o Auto Passenger
		o Transit Passenger
		o Other

These trip tables are transferred from SANDAG's mainframe computer to an IBM-PC microcomputer on which the CCTAP model is based. A conversion process is then executed to adopt the trip tables for CCTAP use, comprising the following main steps:

1. Rebuild trip tables for IBM-PC, and aggregate trip tables for total all-purpose.

2. Disaggregate within Centre City study area from SANDAG 14 zones to CCTAP 95 zones.

3. Apply final adjustment factors, and assign travel forecasts to Centre City transportation network.

This entire process is explained in detail in Technical Memorandum No. 3.

The CCTAP model offers the capability to manipulate trip tables and evalute the impacts of travel demand on the Centre City transportation, both at a comprehensive areawide level as well as by individual street. It thus allows the analysis of land use and transportation system and network changes.

This quantitative "tool" has been left with the City of San Diego for ongoing use following the completion of this study. It provides the capability of an analytical process that is consistent and compatible with SANDAG's regional travel forecasting work, and allows City staff to evalute detailed Centre City issues, new alternatives, and potential changes to the CCTAP, both rapidly and conveniently. It will be a key component in monitoring and updating, where necessary, the recommended CCTAP.

B. OVERVIEW OF FUTURE TRAVEL DEMAND

The projected growth in travel activity associated with Centre City is summarized in Table 15. The table shows trip ends in Centre City for the Existing, Level 1, 2 and 3 cases, for auto driver, auto passenger and transit passenger modes. Overall, travel activity associated with Centre City is projected to increase by about 45 percent for Level 1, by almost 100 percent for Level 2, and by about 80 percent for Level 3. In the "worst case," the Level 2 forecast, total trip ends in Centre City would increase from today's total of 402,000 to a future total of 803,000 (person) trip ends.

While the number of auto driver trip ends is forecast to almost double between existing and Level 2 conditions, transit trips are projected to increase by almost four times for the Level 2 scenario. The existing mode split of 7 percent of all trips by transit is projected to increase to about 8 percent for Level 1 and 12 percent for Levels 2 and 3. This is largely reflective of the extended transit system assumed to be in place by the year 2005. A final key conclusion from the data in Table 15 is that the travel forecasts for Level 3 are quite close in magnitude to the forecasts for Level 2, indicating a low sensitivity of travel demand forecasts between the optimum employment and optimum residential scenarios, for travel to/from Centre City.

TABLE 15. CENTRE CITY TRAVEL FORECAST TOTALS

	Centre City Trip Ends			
Mode	Existing	Level 1	Level 2	Level 3
Auto Driver	274,850 68%	387,545 67%	504,835 63%	457,195 63%
Auto Passenger	102,620 25%	145,860 25%	199,125 25%	180,075 25%
Transit Passenger	25,000 7%	47,400 8%	99,400 12%	90,800 12%
TOTAL	402,500 100%	580,800 100%	803,400 100%	728,100 100%
Growth		+44%	+97%	+79%
Vehicle Occupancy		1.38	1.39	1.39

High growths are forecast for travel into Centre City across the northern cordons (Harbor to Union in the northwest, and Front to Sixth in the north). Significant, but lower, growths in traffic are also projected across the eastern cordon (B Street to K Street). A high percentage growth is indicated across the southeastern cordon (Imperial to Harbor) indicating the increased use of Harbor Drive as an entry route into Centre City from the south, although this will remain, as at present, the lowest-volume cordon segment.

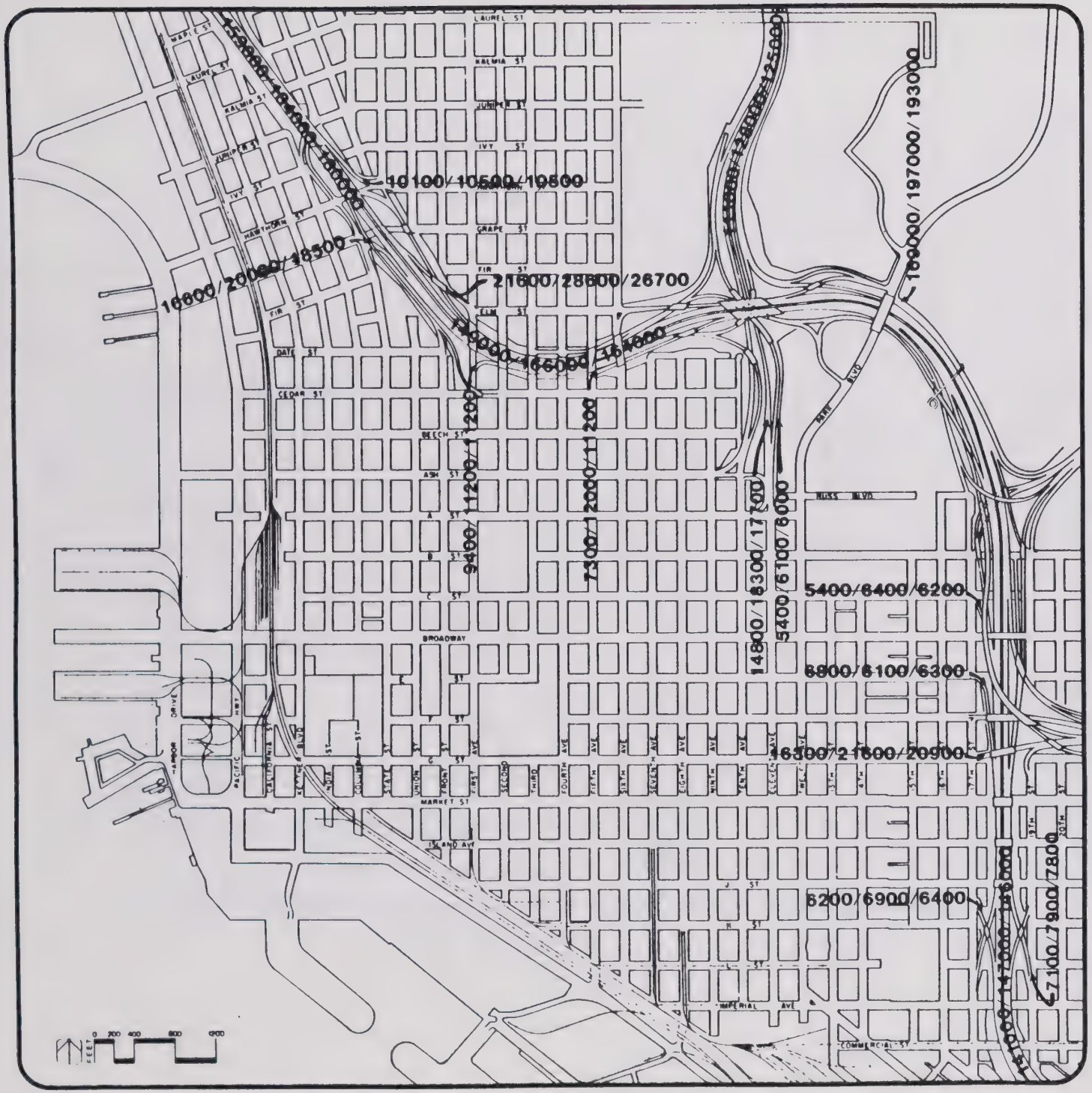
C. REGIONAL ACCESS CONSIDERATIONS

Regional access to Centre City is provided principally by the freeway system, and the following discussion addresses future traffic conditions projected for I-5, SR's 163 and 94, and freeway ramps in the vicinity of Centre City. Figure 14 illustrates for these facilities--mainline and on-ramps--daily traffic levels forecast under the three future land use scenarios.

Freeway Mainline Forecasts

For the Level 2 Scenario, daily freeway volumes on I-5 would reach about 184,000 ADT north of Centre City, and up to 193,000 ADT in the vicinity of Park Boulevard. SR-163 would carry 128,000 ADT and SR-94 about 153,000 ADT for the Level 2 Scenario. As illustrated in Figure 14, freeway volumes for the Level 1 Scenario would be significantly lower than for Level 2, while the Level 3 forecasts are not appreciably different from those for Level 2.

Table 16 summarizes capacity (existing plus planned), volumes and volume/capacity (V/C) ratios for the Level 1, 2 and 3 forecasts. A ratio of less than 0.85 indicates a facility operating satisfactorily (i.e., better than a Level of Service D "design standard"). A ratio of between 0.85 and 1.00 indicates a facility operating below desired conditions, but not yet at capacity; i.e., some congestion. A ratio of higher than 1.00 indicates a facility operating over capacity with resultant significant congestion. Under Level 1, the key capacity problems in the PM peak-hour will be on SR 94 (EB) and, in particular, SR 163 (NB). I-5 will be operating close to capacity around Centre City, and above capacity north of Centre City.



CENTRE CITY
Transportation Action Program

Legend:

XXXX/XXXX/XXXX
LEVEL 1/LEVEL 2/LEVEL 3

NOTE: MAINLINE FREEWAY VOLUMES SHOWN ARE TWO-WAY.

SOURCE: PRC ENGINEERING, INC.

FIGURE 14
FREEWAY MAINLINE AND ON-RAMP FORECAST DAILY TRAFFIC VOLUMES

prc
PRC Engineering, Inc.

TABLE 16. FREEWAY MAINLINE PM PEAK-HOUR VOLUME/CAPACITY ANALYSIS

Location	Capacity	Level 1 Volume	V/C	Level 2 Volume	V/C	Level 3 Volume	V/C
SR 94 east of I-5 ramps	7,200	8,210	1.14	10,410	1.45	9,970	1.38
SR 163 north of I-5 ramps	3,600	6,630	1.84	7,670	2.13	7,470	2.08
I-5 near Washington	7,200	8,630	1.20	10,960	1.52	10,420	1.45
I-5 near Laurel	9,000	8,730	0.97	10,100	1.12	9,910	1.10
I-5 near Fifth	10,800	8,210	0.76	9,140	0.85	9,040	0.84
I-5 near Park	10,800	9,320	0.86	10,850	1.00	10,620	0.98
I-5 near Imperial	9,000	7,730	0.86	8,110	0.90	8,050	0.89

Note: All figures are for peak direction.

Under Level 2, traffic volumes on both SR-94 and SR-163 will be significantly over capacity. I-5 will be over-capacity in the vicinity of Laurel with a V/C ratio of 1.12 under Level 2, and close to or at capacity around Centre City. North of Washington Street, the V/C ratio is projected at about 1.52 under Level 2, indicating significant capacity problems.

Volume/capacity ratios, such as those forecast on SR-94, SR-163 and I-5, may be interpreted such that heavy traffic will prevail for well in excess of one hour, and that the peak period will likely "spread" on these facilities. It should be noted that the V/C ratios for I-5 around Centre City are averages for all lanes. In reality, the outside lanes, particularly auxiliary lanes, may operate at V/C ratios higher than the average due to weaving and merging traffic.

Ramp Traffic Forecasts

Figure 14 also illustrates forecast ADT's for freeway on-ramps in the Centre City area, for the three alternative land use levels. (PM peak-hour volumes, capacities and the resultant V/C ratios are listed in Appendix C.) The principal capacity problems in the future regarding on-ramps to the freeway system will be in the northern part of Centre City. Many of these ramps will have V/C ratios higher than 0.85 by Level 1 and above 1.00 for Levels 2 and 3. Levels 2 and 3 would give rise to critical capacity deficiencies for several on-ramps, in particular I-5 NB at Elm (V/C of 2.67) and SR 163 NB at Eleventh (V/C of 1.42), and to a lesser extent I-5 SB at Fifth (V/C of 1.12), SR 94 EB at G (V/C of 1/08), and I-5 SB at First (V/C of 1.04). Considerable traffic queueing and delays would be expected for the I-5 NB at Elm, and for SR 163 NB at Eleventh. On the east side of Centre City, the SR-94 EB on-ramp will be over capacity under Level 2, but the I-5 ramps would generally remain below an 0.85 V/C ratio, despite significant traffic volume increases.

D. CENTRE CITY CIRCULATION

1. ROADWAY SYSTEM

For purposes of analysis and presentation of the travel forecasts in Centre City, a series of eight screenlines were defined across Centre City to aid in the analysis of potential capacity deficiencies. The location of these screenlines are shown in Figure 15. Travel forecasts (24-hour volumes) for these locations for development Levels 1, 2 and 3 are shown in Figures 16, 17 and 18, respectively. Peak-hour (evening) volumes for all land use levels along with street capacities and resultant V/C ratios, were calculated for these locations, and are listed in Appendix C. Based on an analysis of the travel forecasts, the following conclusions were drawn.

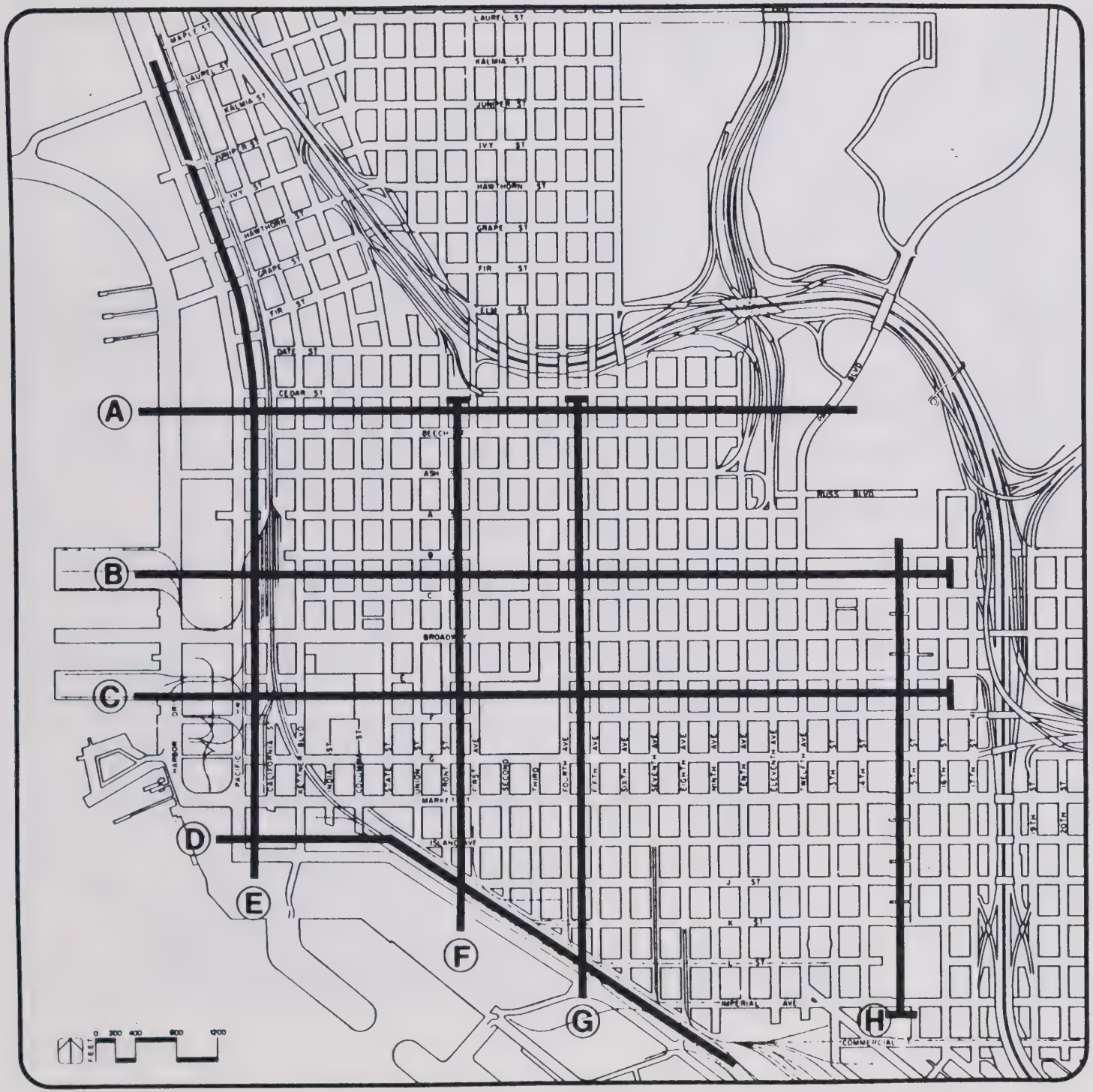
General Conclusions

Capacity shortfalls would be most pronounced in the "core" area west of Sixth Avenue, due to the primary development locations assumed for Centre City.

Traffic flows from I-5 in the northern part of Centre City to the core area and "new core" west of Front will lead to high traffic volumes on both north-south streets and east-west streets, in the area west of Sixth Avenue and north of Broadway. Traffic flows accessing the core and waterfront areas from the east side of Centre City will lead to high traffic volumes on east-west streets, particularly west of Sixth Avenue.

The lack of direct connections from I-5 to the west side of Centre City, effectively funnels traffic across the northern cordon between Front and Sixth Avenues. The major access corridors in this location will be approaching capacity by Level 1. Under Level 2, traffic volumes would increase considerably, with much of the increase occurring on the minor streets. Although traffic loads would thus be spread across City Centre streets, freeway access would remain a significant problem.

At the northern cordon, key streets such as Harbor, First, Fifth and Park will be operating with V/C ratios between 0.85 and 1.00 by Level 1, with no streets having

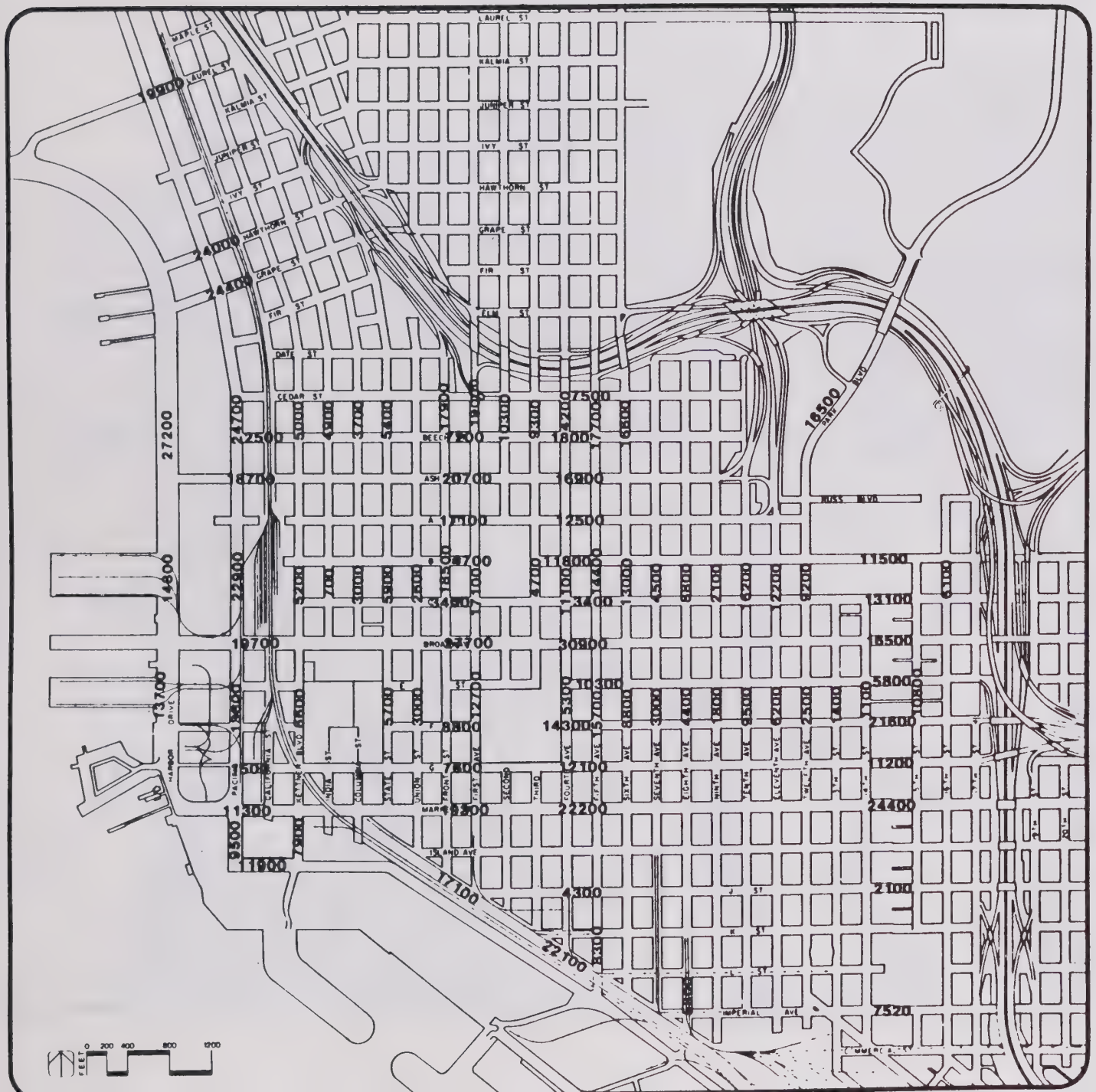


CENTRE CITY
Transportation Action Program

Legend:

FIGURE 15
LOCATION OF ANALYSIS SCREENLINES

prc
PRC Engineering, Inc.



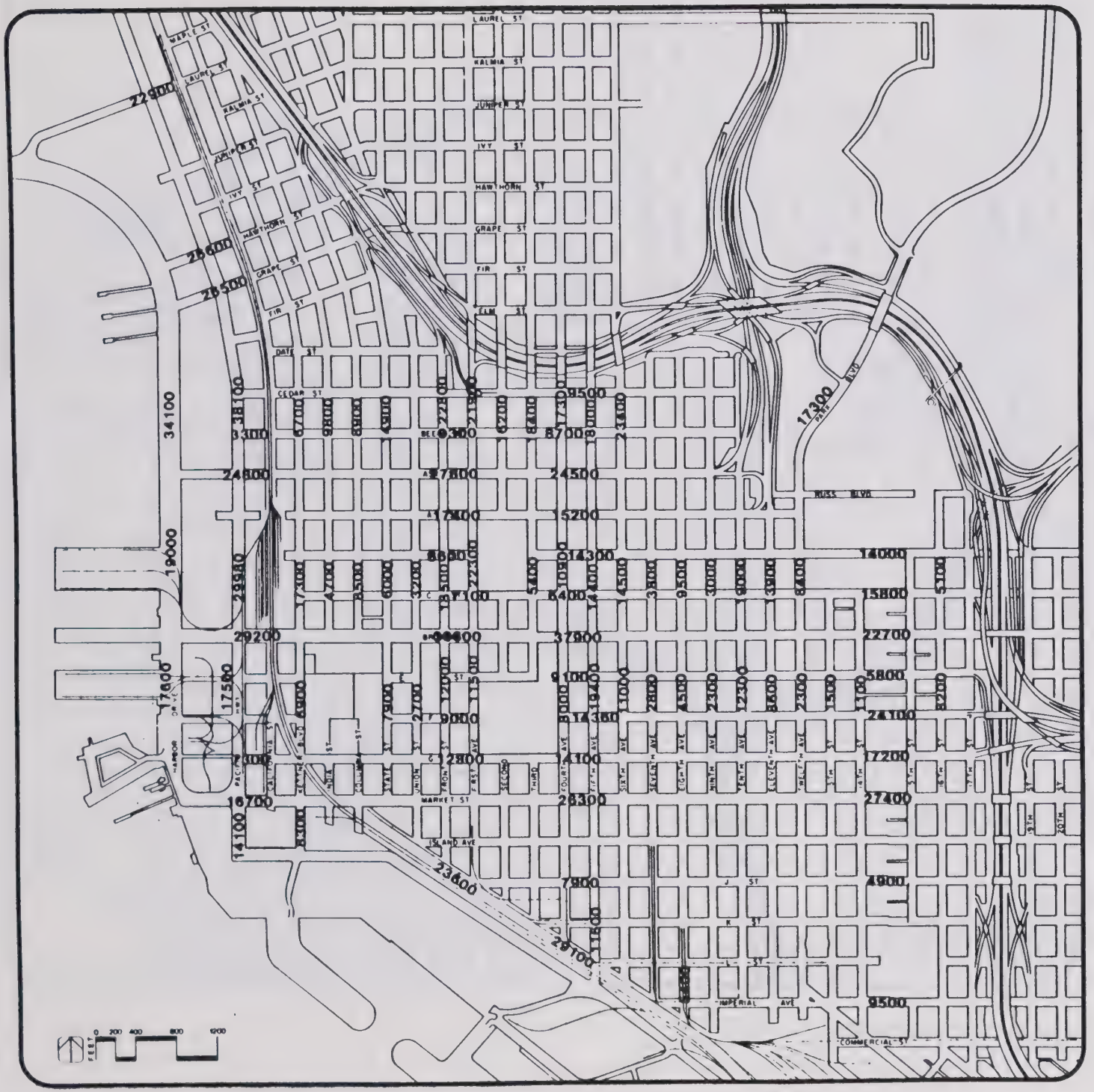
CENTRE CITY
Transportation Action Program

Legend:

SOURCE: PRC ENGINEERING, INC.

FIGURE 16
FORECAST DAILY TRAFFIC VOLUMES
LEVEL 1 SCENARIO

prc
PRC Engineering, Inc.



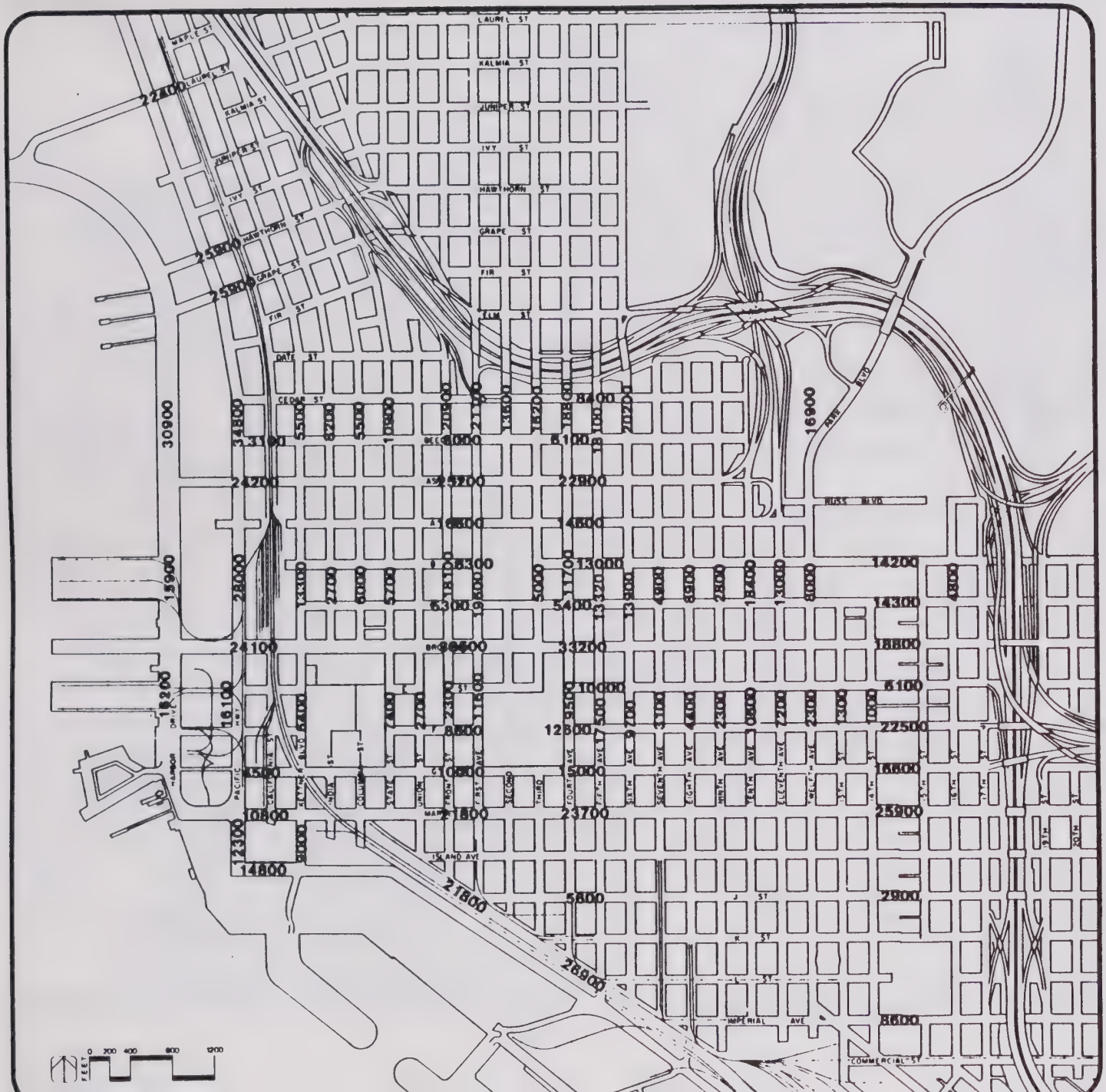
CENTRE CITY
Transportation Action Program

Legend:

SOURCE: PRC ENGINEERING, INC.

FIGURE 17
FORECAST DAILY TRAFFIC VOLUMES
LEVEL 2 SCENARIO

prc
PRC Engineering, Inc.



CENTRE CITY
Transportation Action Program

Legend:

SOURCE: PRC ENGINEERING, INC.

FIGURE 18
FORECAST DAILY TRAFFIC VOLUMES
LEVEL 3 SCENARIO

prc
PRC Engineering, Inc.

a V/C ratio above 1.00. By Level 2, however, many streets would be over capacity including Harbor Drive (V/C ratio of 1.14), First (1.01), Second (1.08), Third (1.26) and Fifth (1.00).

Critical capacity problems on north-south streets would not, in general, extend throughout Centre City. At the B/C Street Screenline, and the E/F Street Screenline, for example, although a number of major streets exhibit V/C ratios close to 0.85 by Level 2, there are few streets over capacity (one is Fifth Avenue, particularly south of Broadway, and at Harbor Drive).

The travel forecasts indicate that as the access routes to I-5 in the north of Centre City become congested, there will be an increasing tendency for traffic from the east to travel across Centre City to destinations in the west of downtown. This is reflected in the high volumes forecast for Broadway (projected 40,000 ADT in places). Also, Harbor Drive will grow in importance as a route for Centre City access from the southeast. Over 29,000 vehicles per day would be using Harbor Drive near Fifth Avenue under the Level 2 forecasts.

The assumed development patterns in the area west of Sixth and north of Market (with parking assumed in reasonable proximity), coupled with the lack of east-west streets connecting across Centre City, will lead to heavy traffic volumes on Broadway, Ash and A Streets. Under the Level 1 Scenario, sufficient capacity is projected for the east-west streets in the location of Pacific Highway. However, by Level 2, Broadway is forecast to be over-capacity, and Ash Street above design capacity, close to Pacific Highway.

In the center of the core area (Screenline F between Front/First), sufficient capacity is projected under Level 1 for east-west streets with the exception of Broadway, which is forecast to be at capacity. By Level 2, however, the analysis exhibits high V/C ratios for all east-west streets except C Street. Beech, Broadway and G Streets are projected to be above capacity, and Ash, A, Market and Harbor to have V/C ratios of between 0.85 and 1.00. Broadway at this location would be 60 percent over capacity under the Level 2 forecasts.

Daily traffic on Harbor Boulevard and Pacific Highway will likely double from base year volumes up to Level 2 forecasts. Fifth Avenue will become increasingly important for north-south travel, particularly south of Broadway, with corresponding capacity problems.

Lower traffic growth and significantly fewer problems are forecast for the eastern part of Centre City. The planned direct connection between southbound SR-163 and eastbound SR-94 serves to reduce surface street traffic. Projected development levels in east Centre City are far lower than elsewhere. In addition, the Tenth/Eleventh/Twelfth Avenues corridor does not really provide for convenient access between the downtown core and parking areas north of A Street, to SR-163 or I-5 north. The lack of a direct connection for B Street through Centre City, and the heavy volumes forecast for Broadway, will lead to significant pressures on Ash/A Streets, and also Beech and Cedar, for east-west access across the northern part of Centre City.

2. PARKING

There are currently 40,200 parking spaces in Centre City. On average during the day, the parking supply in the core area is about 80 percent occupied and in the outlying areas of Centre City is about 70 percent occupied. Given that at peak times, these occupancy figures are probably higher, there is not a significant amount of spare parking capacity in Centre City.

For the purposes of the travel forecasts described earlier in this document, it was assumed that there would be no constraints on travel demand into Centre City from limitations in the parking supply. The travel forecasts are thus unconstrained demand estimates and assume parking would be available to meet projected needs.

Based upon the projected growth in auto travel to Centre City, Table 17 summarizes the estimated parking space needs for each of the three land use scenarios. An estimated 11,200 additional spaces would be necessary for Level 1, almost 27,000 additional spaces for Level 2, and just over 20,000 additional spaces for Level 3. Note that these estimates assume that 10 percent of the existing supply is generally unoccupied and available for future usage. All of these additional spaces will need to be provided off-street.

TABLE 17. PROJECTED CENTRE CITY PARKING NEEDS

Scenario	Total Parking Spaces	Additional Spaces Required
Existing	40,150	-
Level 1	51,300	+11,200
Level 2	66,850	+26,700
Level 3	60,400	+20,250

Note: Assumes 10% of current supply unoccupied and available for future needs.
Source: PRC Engineering (based upon Levels 1-3 travel forecasts).

For the purposes of the current analysis, a continuation of today's practices was assumed, whereby new developments provide some parking on site (usually in basement garages). The excess parking requirements were assumed to be provided in proximity to the future developments. These would be either in structures, or on surface lots, that would be operated either by private or public agencies. Any shortages in available parking, should future supply not match demand, may place more demand on improved transit service.

3. TRANSIT

Significant increases will occur in both transit service (system capacity) and transit passenger levels, for the future development scenarios. By the Level 2 scenario, the level of trolley service into Centre City is expected to quadruple with additional capacity provided by the lines planned in the RTP. Express Bus service capacity into Centre City is expected to double, while it is anticipated that local bus service for Centre City will remain largely at current levels.

As documented earlier, transit passenger volumes into Centre City are projected to increase by about four times over today's levels, consistent with the planned increases in transit capacity. Transit will thus clearly play an increasingly significant role in the overall Centre City transportation system, as its share of travel movement increases. The increasing emphasis will be towards the light rail lines planned to serve Centre City.

When the projected increases in traffic volumes are also considered, there will be certain areas of conflicting demand for roadway space between automobiles and transit service. Some of the more critical issues will include the following: Broadway will continue to be a high-conflict corridor, particularly with the projected traffic volumes, and the continued focus of transit routes along much of its length. The higher traffic volumes will increasingly impede bus movement through Centre City, impacting service schedules and reliability. Transit routes using the Front/First and Fourth/Fifth couplets will also experience increasing conflicts with higher traffic volume levels. Pedestrian conflicts along Broadway will also likely increase, particularly if Broadway continues to be the major bus service corridor.

Conflicts may also arise regarding trolley route needs in Centre City, particularly regarding the North Line and the Bayside Line. Potential alignments for the North Line include Pacific Highway, the railroad right-of-way, and Kettner Boulevard. Traffic volumes on both Pacific Highway and Kettner Boulevard will be considerably higher in future years, particularly if their use as alternate entry corridors, to the Front/First portal, into Centre City is encouraged. It thus may not be possible to include both trolley and traffic lane needs in existing right-of-way.

On the Bayside alignment, the key issue for the trolley alignment is whether it should run north or south of Harbor Drive before connecting across to the Imperial/Twelfth station. Harbor Drive will play an increasingly important traffic access role for Centre City, with significantly increased traffic volumes projected for the Level 2 development scenario. A trolley alignment crossing Harbor Drive would lead to possible delays both for the trolley, and for Harbor Drive auto traffic, at the crossing locations.

Regarding regional access to Centre City, the emphasis on increasing transit use will be on the planned trolley lines. This will be advantageous in that service will run on reserved rights-of-way and be largely unaffected by highway congestion. Express bus service and local bus service will, however, have to use the roadway system and will thus be subject to the future conditions identified earlier for those systems. There will be a need for a preferred transit network to preserve available corridors for bus routings.

4. PEDESTRIAN CIRCULATION

Currently, the key area of pedestrian activity in Centre City is in the core area, including pedestrian circulation north from the core to parking areas and south to the Gaslamp District. The principal area of pedestrian activity is along Broadway, due largely to the concentration of bus service along this street.

The development scenarios assumed for the Levels 1, 2 and 3 analysis would all extend the primary area of pedestrian circulation and lead to significant increases in pedestrian volumes. Land use developments west of Front Street, particularly such as the Santa Fe project, and retail/commercial developments along Harbor Drive will all serve to increase pedestrian activity significantly. North of Broadway, the development of a secondary business core west of Front Street, forming an axis with the Government Centre area, and the existing business core area, seems likely to lead to higher pedestrian circulation in an east-west direction. This may produce conflicts with the Front Street/First Avenue couplet which is a key north-south element of the vehicular circulation system.

The Convention Center and hotel developments along the southern waterfront may also be expected to generate pedestrian activity, both along the waterfront and northward to the Gaslamp District, Horton Plaza, and the business core. In addition, Horton Plaza will generate considerable pedestrian movements, and increase pedestrian circulation across Broadway between Horton and the business areas to the north. The high traffic volumes forecast along Broadway indicate considerable conflict between pedestrians and vehicles will occur, particularly between Front Street and Sixth Avenue. The development of residential land uses south of Broadway and west of Fourth Avenue, although relatively minor in relation to overall Centre City development, would be expected to generate pedestrian flows north over Broadway into the business core.

As the downtown core expands and increases in density, the amount of parking outside the core will also increase. This in turn will generate increased pedestrian circulation from the outer parking into the central area. An example is access from parking areas north of Ash Street South into the core. As the traffic forecasts indicated, the Ash/A Street couplet becomes increasingly significant in

the Centre City circulation system as an east-west route across Centre City, so this is another area where pedestrian/vehicular conflicts may need to be resolved.

Thus, much of the pedestrian circulation activity will occur in areas or corridors of high projected traffic activity. In certain cases, the pedestrian volumes may also be expected to further impact traffic levels of service. However, much of the pedestrian activity will probably occur during the midday rather than the peak periods, particularly activity associated with Horton Plaza, other retail uses, and between downtown businesses. The principal pedestrian activity during the evening peak hour for example would be from workplace to parking lots or transit stops.

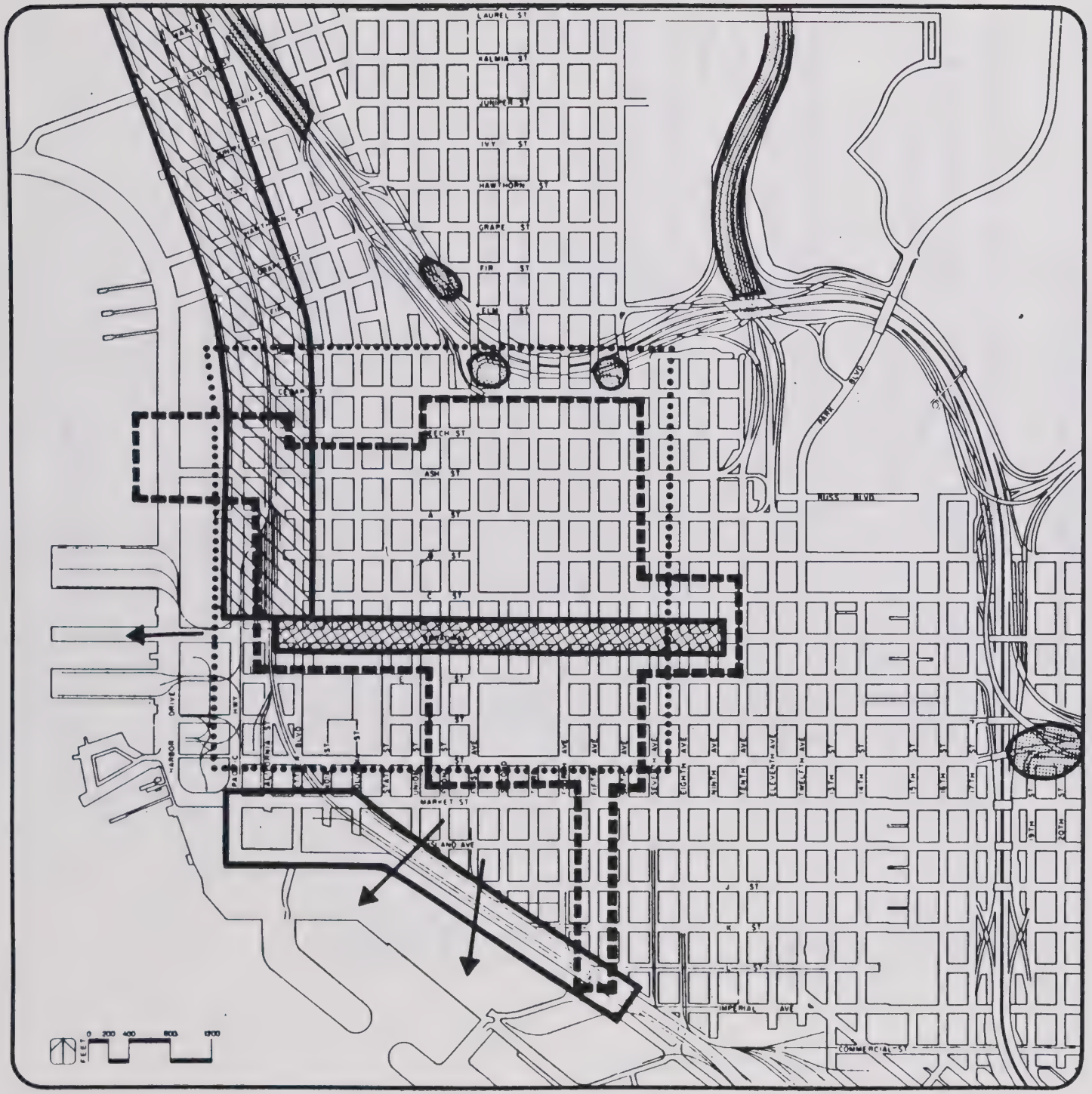
Pedestrian access routes between the core area and the waterfront are limited both in the west and the south to a few routes, and some of these will also carry high traffic loads in future years (e.g., Broadway, Ash). In the south, there is no direct access to the retail and business core from the waterfront. Pedestrian access in this respect is circuituous (as is vehicular access) to traverse the railroad tracks.

As Centre City grows in the future, it will be important to ensure that pedestrian access routes exist between major areas and land use functions, that the pedestrian routes/facilities are of adequate quality, and that conflicts with vehicular traffic are minimized. In the downtown core, pedestrian needs will face severe competition from other uses for limited street space, for example the conflict between needing to widen sidewalks for pedestrians and also providing sufficient roadway capacity for traffic flows.

E. SUMMARY OF FUTURE DEFICIENCIES

The key conclusions from the analysis of future deficiencies may be summarized as follows. Figure 19 illustrates the locations of key problem areas.

- Trips into Centre City would increase by 44% under Level 1, by 97% under Level 2, and by 79% under Level 3.



CENTRE CITY
Transportation Action Program

Legend:

- FREEWAY/RAMP CAPACITY DEFICIENCY
- GENERAL LIMIT OF STREET CAPACITY DEFICIENCIES
- BUS-AUTO-PED CONFLICTS
- LRT-AUTO POTENTIAL CONFLICTS
- PRINCIPAL AREA OF PEDESTRIAN ACTIVITY
- OTHER KEY PEDESTRIAN CORRIDORS

FIGURE 19
GENERAL LOCATIONS OF FUTURE DEFICIENCIES

prc
PRC Engineering, Inc.

- If the Level 2 development scenario were reached, total trips into/out of Centre City would increase from a daily total of 402,000 to a future total of 803,000. Trips by automobile would almost double while transit trips would increase about four-fold.

- For Level 1, the key freeway capacity problems would occur on SR-163. Overloads would also occur, but to a lesser degree, on SR-94 and I-5 north of Centre City. For Level 2, SR-163 is projected to be significantly over-capacity, as are I-5 north of Centre City, and SR-94. In the immediate vicinity of Centre City, I-5 would operate close to or at capacity.

- The key capacity deficiencies for freeway ramps under the Level 2 and 3 scenarios, during the evening peak period, would be I-5 NB at Elm, and SR 163 NB at Eleventh, and to a lesser extent I-5 SB at Fifth, SR-94 EB at G, and I-5 SB at First.

- Within Centre City, capacity shortfalls would be most pronounced in the "core" area west of Sixth Avenue, due to the primary development locations assumed for Centre City. The lack of direct connections from I-5 to the west side of Centre City would effectively funnel traffic across the northern cordon between Front and Sixth Avenues. Key streets such as Harbor, First, Fifth and Park would operate with V/C ratios between 0.85 and 1.00 by Level 1, with no streets having a V/C ratio above 1.00. By Level 2, however, many streets would be over-capacity, including Harbor Drive (V/C ratio of 1.14), First (1.01), Second (1.08), Third (1.26) and Fifth (1.00).

- As access routes to I-5 in the north of Centre City become congested, traffic from the east will increasingly travel across Centre City to destinations in the west of downtown. This is reflected in the high volumes and capacity deficiencies forecast for Broadway. Also, Harbor Drive will grow in importance as a route for Centre City access from the southeast, leading to capacity problems on Fifth Avenue under the Level 2 forecasts.

- In the center of the core area, sufficient capacity is projected under Level 1 for east-west streets with the exception of Broadway, which is forecast to be at capacity. By Level 2, high V/C ratios would be reached for all east-west streets except C Street. Beech, Broadway and G Streets are projected to be above capacity, while Ash, A, Market and Harbor would be close to or at capacity. Broadway at this location would be 60 percent over-capacity under the Level 2 forecasts. The lack of a through connection for B Street, and heavy Broadway volumes, will thus apply significant pressures on other east-west streets in Centre City.

- Both transit service capacity and transit passenger volumes will increase significantly under all development scenarios tested. Key problem areas for transit will be bus-auto conflicts on streets carrying transit routes, such as Broadway and the Front/First couplet, and LRT-auto conflicts in planned trolley corridors such as for the North Line (Pacific Highway/Kettner Boulevard), and Bayside (Harbor Drive). Bus transit service will also be affected by the freeway ramp capacity deficiencies identified earlier.

- The development scenarios assumed would all extend the primary area of pedestrian circulation and lead to significant increases in pedestrian volumes. Assumed development patterns would lead to increased east-west flows between the financial core, Columbia district, and the waterfront, with potential pedestrian-auto conflicts with the Front/First couplet, and Pacific Highway corridors.

- Significantly increased pedestrian flows may also be expected across Broadway, particularly related to Horton Plaza, as well as further south to the Convention Center and other developments along the southern waterfront. Current access is currently very limited for the latter demand pattern.

The following chapters of this report document a wide range of potential solutions to the future system deficiencies identified in the preceding analysis, as well as documenting their general applicability and effectiveness as determined from an alternatives evaluation analysis.

IV.
ALTERNATIVES ANALYSIS

Based on the analysis of future system deficiencies, four alternative transportation solution packages were developed, tested and evaluated. Following this evaluation process, the most effective elements of the action packages were selected for inclusion in the recommended transportation program. This Chapter discusses the composition of the four alternative action packages, the analytical results for each package, and the relative effectiveness of the alternative packages in addressing transportation problems.

The four action packages were analyzed with respect to traffic forecasts for the Level 2 development scenario. Level 2 represents the highest development potential for the year 2005, and thus the "worst case" scenario in terms of travel demand. Some of the measures evaluated would thus only be necessary or appropriate in the longer term, or not at all if Level 2 development were not achieved.

A. DEFINITION OF ALTERNATIVE TRANSPORTATION PACKAGES

1. BACKGROUND METHODOLOGY

Four different action packages were developed for testing and evaluation purposes. The emphasis of each varies, in terms of cost to implement, policy ramifications, feasibility, and whether the primary focus is upon increasing transportation supply or reducing travel demand.

As an overview, Table 18 summarizes different types of improvement actions, associated principal action orientation, and the packages to which the various action types were allocated. The packages may be summarized as follows:

- Package I emphasizes optimization of efficiency through various traffic management treatments and capacity expansion through on-street parking management.

- Package II is largely demand-management oriented, and focuses upon the potential for pooling and ridesharing, work schedules, road pricing and related strategies, and non-vehicular modes (pedestrian, bicycle), to reduce the level of transportation demand.

- Package III emphasizes transit and off-street parking management strategies, mostly to control demand but also for augmenting transit capacity.

- Package IV is heavily oriented towards increasing system capacity, including freeway/ramp capacity enhancements, major street system widenings and extensions, and transit service expansions.

TABLE 18. TRANSPORTATION IMPROVEMENT ACTIONS SUMMARY

Type of Action	Packages	Principal Action Orientation		
		Optimize Efficiency	Control Demand	Expand Capacity
Traffic Management	I	●	○	○
Parking Management	I, III		●	○
Pooling/Ridesharing	II		●	
Activity Management	II		●	
Non-Vehicular	II		●	○
Road Pricing	II		●	
Paratransit	III		●	○
Transit Service	III, IV		●	●
New Construction	III, IV	○		●

Key: ○ Major Orientation ○ Minor Orientation

The packages thus cover a considerable range of transportation solutions ranging from low-cost simple measures in Package I to higher-cost capital measures in Package IV.

Package I was organized to facilitate evaluation of a variety of relatively low-cost traffic management strategies to improve system capacity. Table 19 lays out the various action elements and purposes, and Figure 20 illustrates potential locations for these measures.

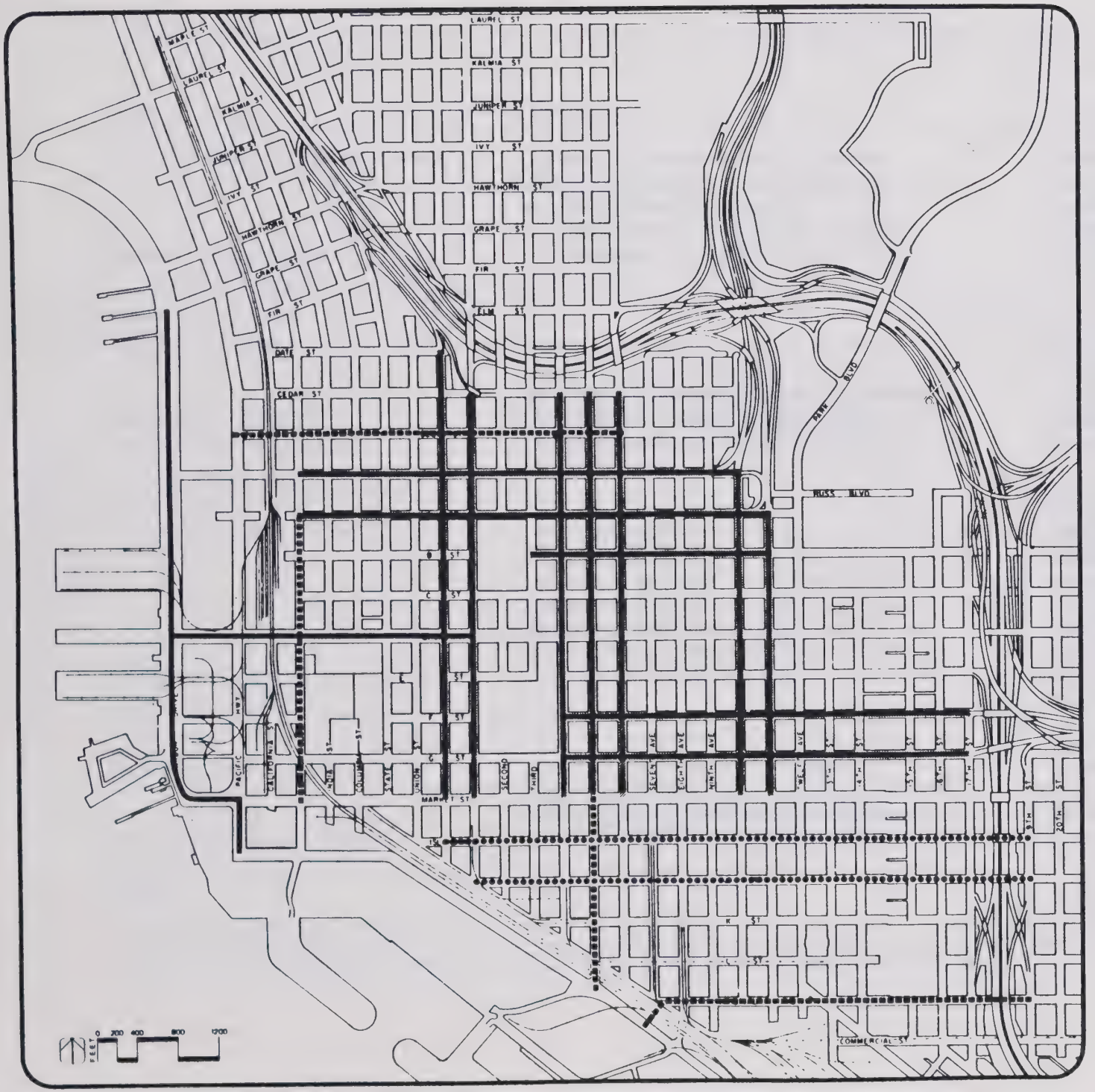
Package II was developed with a strong demand reduction and TSM (Transportation System Management) emphasis to attempt to shift motorists away from single-occupant autos to HOV's, and to a lesser extent control demand through auto restrictions, road-use pricing, pedestrian and bicycle incentives. Table 20 outlines the major action types. The majority of these actions would relate to Centre City as a whole rather than specific locations.

Package III is strongly oriented to auto parking policies, transit (bus, LRT) routing, transit preferential treatment and local circulation services. The principal focus is upon management of travel demand. Package III includes the major action types listed in Table 21. Figure 21 shows the location of the measures tested.

Package IV was more capital-intensive than the other packages, with more of a regional focus than the others, and was oriented almost exclusively towards enhancing system capacity. The individual elements of Package IV are outlined in Table 22 and illustrated in Figure 22.

TABLE 19. TRANSPORTATION ACTION PACKAGE I - INCREMENTAL TRAFFIC MANAGEMENT

Action	Elements	Purpose
Restrict On-Street Parking	Along major one-way and two-way streets, during peak periods (e.g., Front, First, Ash, A, Fourth, Fifth, Sixth).	In conjunction with peak-period truck delivery restrictions, peak-period on-street parking restrictions provide additional roadway space (e.g., four lanes for 1-way streets). Additional capacity enhances movement along these major roadways, and reduces congestion.
Modify Signal Timings	Along major corridors, in particular Broadway and north-south access roadways.	Add green time to major flow corridors so as to increase traffic capacity, and reduce congestion.
Introduce Reversible Lanes	Along major two-way surface streets and freeway facilities, for example, Pacific Highway, Harbor Drive, Market Street, SR 94 and SR 163.	Where peak-hour directionality warrants, purpose is to provide additional capacity in support of the predominant direction of flow (inbound a.m., outbound p.m.), thus improving traffic flow and reducing congestion.
Improve Freeway Capacity/ Utilization	In a low-cost framework, involves measures to modify use of existing freeway space, including reversible lanes, high-occupany vehicle (HOV) lanes designated for transit and pool vehicles, and a signing program to direct motorists' use of freeway mainline and on/off ramps.	Purpose is to make more efficient use of existing freeway space by enhancing capacity for the predominant direction of flow, augment person-carrying capacity, and more effectively utilize freeway and arterial street capacity by spreading traffic loads.
Low-Cost Street Upgrades/ Conversions	Through restriping, parking restrictions, traffic signalization, upgrade and/or convert roadways from minor to major designation (e.g., Beech, Imperial, Island/J).	Not necessarily complementary; purpose of these elements is either to strengthen major corridors or to provide upgraded alternate routes to help relieve congested major corridors.



CENTRE CITY
Transportation Action Program

Legend:

- UPGRADE TO 1-WAY, 4L, ON STREET PARKING RESTRICTIONS
- CONVERT TO 1-WAY COUPLET
- UPGRADE TO 2-WAY, 4L, LOW-COST IMPROVEMENTS
- UPGRADE TO 2-WAY, 6L, LOW-COST IMPROVEMENTS

NOTE: AREAWIDE ACTIONS WITH NO SPECIFIC LOCATION ARE NOT SHOWN. SEE TEXT FOR A COMPLETE DESCRIPTION.

FIGURE 20
LOCATION OF PACKAGE I MEASURES

prc
PRC Engineering, Inc.

TABLE 20. TRANSPORTATION ACTION PACKAGE II - DEMAND REDUCTION/TSM

Action	Elements	Purpose
Carpool/Vanpool Programs	These pooling programs may be sponsored by major Centre City employers (private or public sector) for their employees.	Purpose is to reduce traffic congestion by converting motorists from single-occupant to multi-occupant vehicles, thus decreasing the number of vehicles on the road.
Staggered/Variable Work Hours	Staggered, variable or flexible work hours programs are usually sponsored by major employers (private or public sector) for their employees.	By varying the work schedule and thus the times at which the commute trip is made, the objective is to shift some work trips from the peak hour. This spreading of the peak reduces traffic congestion during the peak times.
Priority Access for High-Occupancy Vehicles	Greatest potential is for HOV lanes along freeways; less potential for application along major Centre City surface streets.	Increase person-carrying capacity of the corridor; give an added incentive for motorists to switch to higher-occupancy vehicles in order to gain travel time savings with use of such HOV treatments.
Pedestrian Facilities	In the Centre City context, pedestrian enhancements could include sidewalk widenings, and definition of pedestrian networks, and even grade-separations at major conflict points.	Sidewalk widenings and pedestrian routes, focused on minor streets, minimize auto-pedestrian conflicts. Where significant pedestrian volumes must cross high-vehicle

(Continued . . .)

TABLE 20. TRANSPORTATION ACTION PACKAGE II - DEMAND REDUCTION/TSM (Continued)

Action	Elements	Purpose
Pedestrian Facilities (Continued)		traffic streets, pedestrian grade separations (either overpasses or, less likely, tunnels) may be warranted for pedestrian safety, pedestrian incentive, and to maintain vehicle capacity.
Bicycle Facilities	City streets can be striped to provide a bicycle lane. Alternatively, they can simply be signed as bike routes. Other strategies include bike storage provisions at work site, as well as showers/lockers for bike uses.	Provision for bicycle travel, safety and comfort, enhances environment for existing bicycle users and may encourage new riders.
Auto-Restricted Zones	Auto-restricted or auto-free zones within Centre City. The greatest potential would be in the high-density core area (e.g., along Broadway) where large volumes of autos, buses and pedestrians are expected to mix.	Objective would be to divert or redirect auto traffic away from the high activity core, off of overloaded streets such as Broadway. Also street space could be freed up for pedestrians and/or transit (potentially a mall for buses and trolleys).
Central Area Licensing/Tolls	Typically involves either a permit system, whereby permit stickers identify the motorist's authorization to access the core, or payment of daily user fees.	Because of increased cost for motorists to access the core area, traffic volumes and corresponding congestion may be reduced. The corresponding goal would be to increase use of other travel modes, particularly transit.

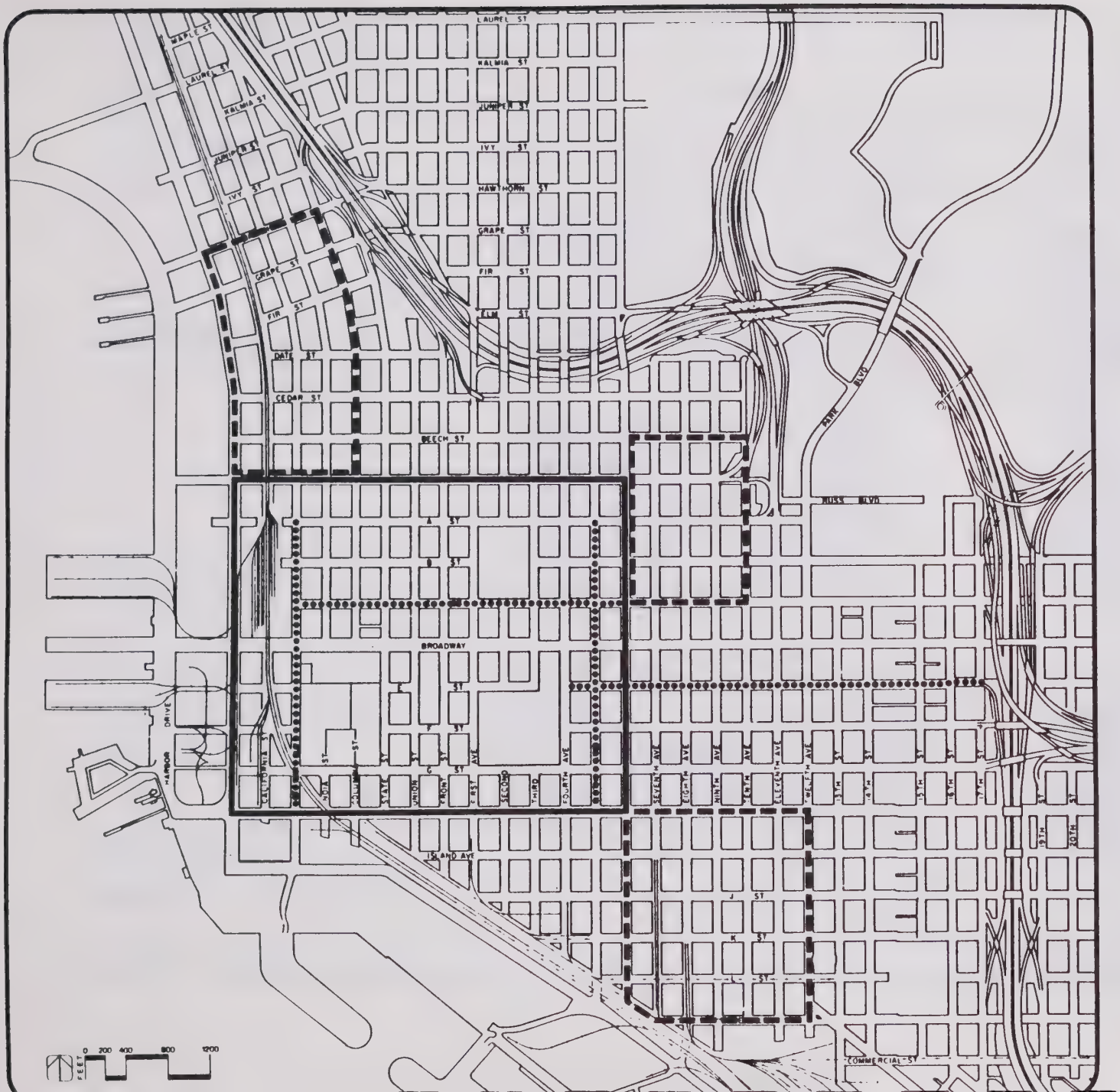
TABLE 21. TRANSPORTATION ACTION PACKAGE III - PARKING/TRANSIT ORIENTATION

Action	Elements	Purpose
Priority Parking for High-Occupancy Vehicles	Designate some core area parking for the exclusive use of carpooling and vanpooling vehicles. This approach could be coupled with differential pricing policies that would favor HOV use of core area parking structures.	Principal purpose is to encourage carpooling/vanpooling for travel to Centre City.
Peripheral Parking Strategies	Two key approaches are possible. One is to locate a portion of Centre City parking facilities outside the high-density core, and to encourage use through differential pricing and other strategies. The other is to capture motorists further "upstream," before they access Centre City. This park-and-ride strategy locates parking lots in suburban areas, such lots being the focus for LRT, express bus and to a lesser extent carpooling and vanpooling activities.	Two objectives are served by the park-and-ride strategy, one being less vehicles on Centre City streets, less traffic in the core area itself and re-directing autos off of highly congested core area corridors like Broadway; the other less traffic on the freeways and ramps used to access Centre City.
Parking Supply Restriction	Supply in the core area could be restricted by a cap on the total number of spaces, or by an upper limit on the rate of parking provision. Core area restrictions are oriented largely to off-street supply.	Purpose of the core area parking supply restriction is the same as the Centre City peripheral parking strategy.

(Continued . . .)

TABLE 21. TRANSPORTATION ACTION PACKAGE III - PARKING/TRANSIT ORIENTATION (Continued)

Action	Elements	Purpose
Parking Cost Changes	Parking pricing policy may be used on an area-wide basis to control levels of auto use; to charge differentially such that motorists would have the incentive to park in peripheral locations rather than in more expensive core area structures; or pricing might be set for HOV's to pay less than single-occupant autos, particularly in core locations.	Purpose would be to reduce the number of autos entering Centre City, and to divert some traffic off of high-volume core area roadways to more peripheral locations, easing congestion and freeing up space potentially for transit and pedestrians.
Transit Routing	Transit routing issues in Centre City include the potential for dispersing bus routes, addressing trolley routes in the downtown, the potential for transit preferential or bus-only streets (malls), contra-flow lanes for buses, and the potential for a transit transfer center.	Bus-only or bus-preferred streets would offer fewer conflicts with autos, enhancing both transit use and pedestrian circulation, and allowing more efficient bus operation in and through Centre City.
Local Centre City Transit	Two different local transit services were addressed. One is a trolley service for the Gaslamp quarter. The other is a bus shuttle system running between Centre City peripheral parking sites and various core locations.	The Gaslamp trolley would link the Gaslamp district to other key uses in Centre City. The parking shuttle system would serve peripheral parking facilities and link them to core locations.



CENTRE CITY
Transportation Action Program

Legend:

- CORE AREA
- PERIPHERAL PARKING AREAS
- TRANSIT STREETS

NOTE: AREAWIDE ACTIONS WITH NO SPECIFIC LOCATION ARE NOT SHOWN. SEE TEXT FOR A COMPLETE DESCRIPTION.

FIGURE 21
LOCATION OF PACKAGE III MEASURES

prc
PRC Engineering, Inc.

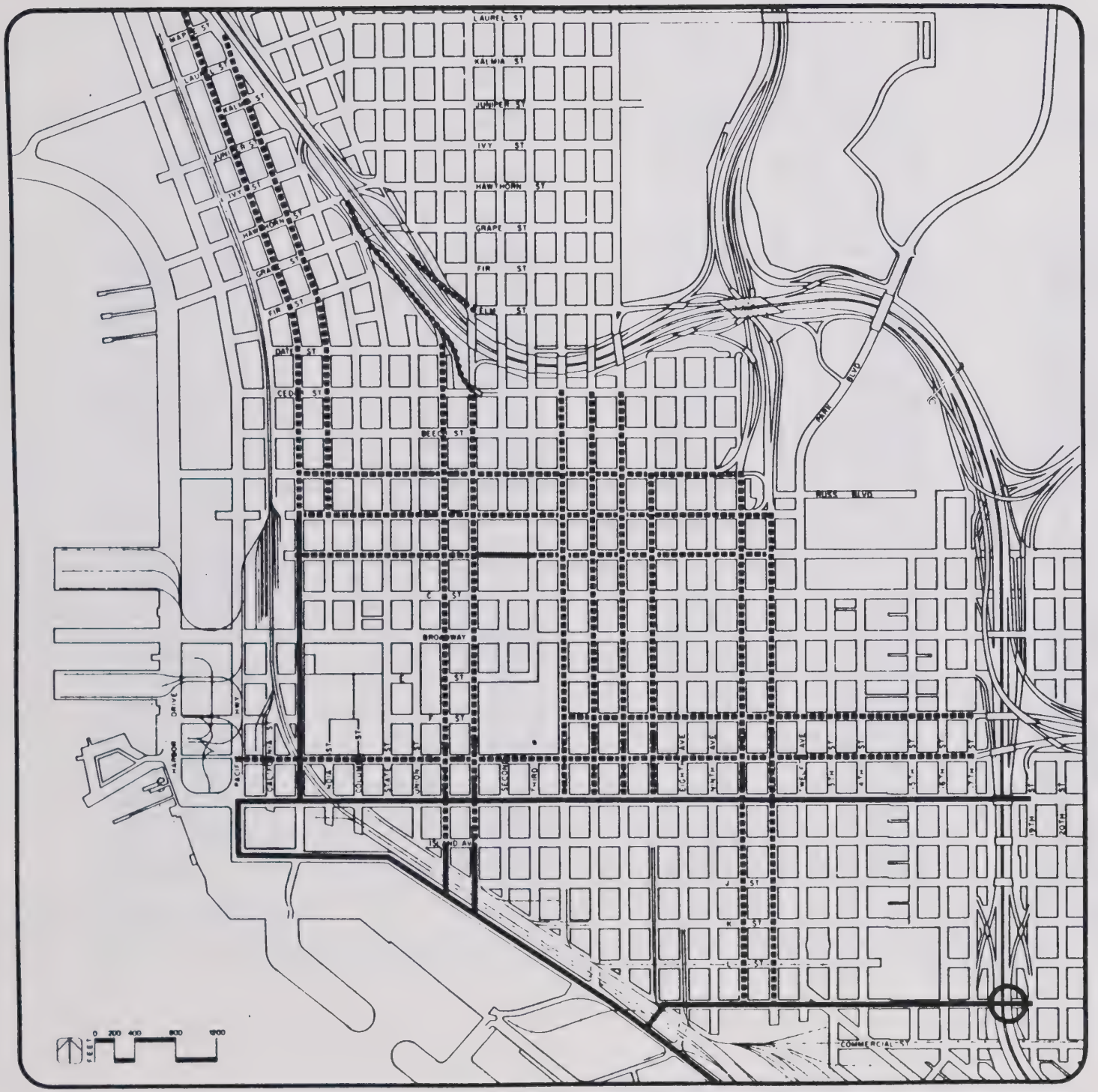
TABLE 22. TRANSPORTATION ACTION PACKAGE IV - CAPITAL PROJECTS

Action	Elements	Purpose
Centre City Street System Changes and Widenings	Key elements tested in this action package include: o Extending "A" Street from Kettner to Pacific Hwy. o Connecting "B" Street through the City Concourse o Extending Front Street and First Avenue to South Harbor Drive o Widening South Harbor Drive o Upgrading Imperial Avenue and improving connection to Harbor Drive	Street improvements provide improved circulation flow and core area access, while reducing traffic flow through the core, and relieving congestion on east-west streets.
Add Freeway Mainline Capacity	Add auxiliary lanes to freeways on approaches to Centre City.	Adding travel lanes to the freeway facilities used to access Centre City will add capacity and reduce traffic congestion along these corridors. Detailed studies would be required to determine feasibility.
Add Freeway Ramp Capacity	Ramp capacity can be enhanced by widening ramps, improving existing connections, or constructing entirely new ramps. Key locations for additional ramping or improved connections potentially include: o I-5, I-8 and Pacific Hwy. o I-5 ramps between Old Town and Front/First o I-5 and Imperial Ave. o I-5 and South Harbor Drive o SR-163 at Tenth/Eleventh	Widening existing ramps should result in less queuing and traffic back-up, provided that the capacity will be in place on the facility being accessed (freeway mainline for on-ramp, surface street for off-ramp). New ramping, by providing alternative locations for accessing/egressing freeways, particularly in conjunction with a freeway signing program can reduce congestion upstream/downstream of the new ramps.

(Continued . . .)

TABLE 22. TRANSPORTATION ACTION PACKAGE IV - CAPITAL PROJECTS (Continued)

Action	Elements	Purpose
Expand Transit Service	Add service routes/lines or increase frequency on planned routes/lines.	By increasing service frequency the average transit wait time is reduced, making transit a more desirable mode. Converting additional motorists to transit would lessen traffic congestion on the highways. Expanded transit service also necessary for increased capacity and new service to developing areas.



CENTRE CITY Transportation Action Program

Legend:

- ..... WIDEN FREEWAY RAMPS
- ○ IMPROVE RAMP ACCESS
- ------ CONVERT/UPGRADE/ EXTEND TO MAJOR 1-WAY, 4L
- —— MAJOR 2-WAY UPGRADES:
  - KETTNER - 4L
  - IMPERIAL - 4L
  - MARKET - 5L
  - PACIFIC - 6L
  - HARBOR - 6L
- —— ROADWAY EXTENSIONS

NOTE: AREAWIDE ACTIONS WITH NO SPECIFIC LOCATION ARE NOT SHOWN. SEE TEXT FOR A COMPLETE DESCRIPTION.

FIGURE 22
LOCATION OF PACKAGE IV MEASURES

prc
PRC Engineering, Inc.

The following sections of this Chapter describe the analysis of each transportation package, first individually and then by way of summary comparison. Much of the analysis was conducted on a quantitative basis, utilizing the forecasting tool developed earlier in the study. For purposes of comparative evaluation, traffic volume information was completed for the critical Center City screenline locations (identified earlier). This information included ADT's, peak-hour volumes and capacities, and volume/capacity ratios. Daily volumes are summarized in Table 23, while the volume/capacity data are included in Appendix D.

B. PACKAGE I - INCREMENTAL TRAFFIC MANAGEMENT

1. ON-STREET PARKING RESTRICTIONS

Peak-period on-street parking restrictions along the principal one-way streets - in connection with truck loading/unloading restrictions would be very effective in reducing congestion. The typical three-lane street could be converted to four lanes[1] during peak hours, increasing capacity by about a third. Parking would be allowed on only one side of the road, during off-peak hours. The congestion problems on north-south access roadways identified for Level 2 would be effectively eliminated. Though low-cost and effective, this strategy would require enforcement costs, and revenues from parking meter use would be reduced.

2. SIGNAL TIMING MODIFICATION

Further modification of signal timings (over and above the recent optimization installed) to favor the flow along major corridors would not achieve significant benefits. Centre City signals have recently been set to optimize the flow (all approaches) through individual intersections, rather than along individual roadways. This optimization is implemented on an areawide basis, however, in order to achieve maximum benefits for Centre City as a whole, and will be updated on a

---

1 Due to the physical constraints of certain garage ramps, it would not always be possible - in a low-cost framework - to obtain the full four lanes. Sometimes only three lanes can be accomplished.

TABLE 23. SCREENLINE COMPARISON OF DAILY TRAFFIC VOLUMES FOR ALTERNATIVE PACKAGES

Screenline/ Location	Level 2	Package I	Package II	Package III	Package IV
North-South Movement, North of Beech:					
Harbor	34,000	40,000	32,000	31,000	35,000
Pacific	38,000	35,000	32,000	33,000	37,000
Kettner	7,000	6,000	6,000	7,000	5,000
India	10,000	10,000	9,000	11,000	11,000
Front	23,000	23,000	22,000	20,000	23,000
First	22,000	25,000	21,000	27,000	25,000
Fourth	17,000	17,000	16,000	21,000	25,000
Fifth	18,000	17,000	17,000	15,000	17,000
Sixth	23,000	23,000	21,000	33,000	19,000
Park	17,000	17,000	16,000	16,000	17,000
Screenline Subtotal	209,000	213,000	192,000	214,000	189,000
North-South Movement, North of "C":					
Harbor	19,000	36,000	18,000	15,000	21,000
Pacific	30,000	21,000	28,000	28,000	31,000
Kettner	17,000	9,000	16,000	N/A	18,000
India	5,000	7,000	4,000	6,000	3,000
Front	19,000	16,000	17,000	18,000	19,000
First	22,000	16,000	21,000	22,000	19,000
Fourth	11,000	7,000	10,000	26,000	17,000
Fifth	14,000	14,000	13,000	N/A	17,000
Sixth	15,000	13,000	14,000	19,000	9,000
Tenth	19,000	21,000	18,000	28,000	21,000
Eleventh	14,000	13,000	13,000	14,000	14,000
Screenline Subtotal	184,000	173,000	172,000	176,000	189,000

(Continued . . .)

TABLE 23. SCREENLINE COMPARISON OF DAILY TRAFFIC VOLUMES FOR ALTERNATIVE PACKAGES

Screenline/ Location	Level 2	Package I	Package II	Package III	Package IV
North-South Movement, North of Harbor:					
Pacific	14,000	21,000	13,000	26,000	25,000
Kettner	8,000	7,000	8,000	2,000	8,000
Front	N/A	N/A	N/A	N/A	10,000
First	N/A	N/A	N/A	N/A	14,000
Fifth	12,000	12,000	11,000	6,000	2,000
Eighth	5,000	4,000	5,000	11,000	9,000
Screenline Subtotal	39,000	44,000	37,000	45,000	68,000
East-West Movement, East of Pacific:					
Ash	25,000	23,000	23,000	26,000	27,000
Broadway	29,000	44,000	27,000	8,000	25,000
"G"	7,000	1,000	7,000	7,000	7,000
Market	12,000	7,000	11,000	11,000	8,000
Harbor	17,000	23,000	16,000	29,000	28,000
Screenline Subtotal	90,000	98,000	84,000	81,000	95,000
East-West Movement, West of First:					
Ash	27,000	26,000	26,000	28,000	23,000
"A"	17,000	27,000	16,000	26,000	24,000
"B"	9,000	5,000	8,000	9,000	25,000
Broadway	40,000	45,000	37,000	19,000	25,000
"G"	12,000	14,000	11,000	10,000	16,000
Market	25,000	24,000	23,000	26,000	31,000
Harbor	24,000	30,000	22,000	26,000	52,000
Screenline Subtotal	154,000	171,000	143,000	144,000	196,000

(Continued . . .)

TABLE 23. SCREENLINE COMPARISON OF DAILY TRAFFIC VOLUMES FOR ALTERNATIVE PACKAGES

Screenline/ Location	Level 2	Package I	Package II	Package III	Package IV
East-West Movement, West of Fifth:					
Ash	24,000	23,000	23,000	32,000	25,000
"A"	15,000	18,000	14,000	19,000	14,000
"B"	14,000	21,000	13,000	16,000	23,000
Broadway	38,000	32,000	35,000	28,000	29,000
"F"	14,000	18,000	13,000	14,000	5,000
"G"	14,000	11,000	13,000	16,000	17,000
Market	26,000	31,000	24,000	26,000	36,000
Harbor	29,000	36,000	28,000	31,000	54,000
Screenline Subtotal	174,000	190,000	163,000	182,000	203,000
East-West Movement, East of 14th:					
"B"	14,000	16,000	13,000	14,000	10,000
"C"	16,000	17,000	15,000	17,000	15,000
Broadway	23,000	22,000	22,000	19,000	16,000
"E"	6,000	4,000	6,000	2,000	4,000
"F"	24,000	26,000	23,000	23,000	21,000
"G"	17,000	22,000	16,000	16,000	18,000
Market	27,000	36,000	26,000	25,000	39,000
Imperial	10,000	15,000	9,000	17,000	16,000
Screenline Subtotal	137,000	158,000	130,000	133,000	139,000

regular basis to be responsive to changing traffic needs. Although some potential may exist for using this measure to emphasize or de-emphasize certain corridors, the entire areawide optimization would need to be reworked around those new parameters.

3. REVERSIBLE LANES

Reversible lanes offer limited potential on major two-way Centre City surface streets, largely due to the lack of the heavy directional splits which are warranted for this treatment. Directional-split data for I-5 and SR-163 also indicate reversible lane treatment would not be appropriate. SR-94, on the other hand, does exhibit strong directionality and would be an excellent candidate for optimizing efficient use of existing freeway space. Ramp treatments would be necessary approaching Centre City, probably involving reversible lanes on the F Street bridge. Reversible lanes on SR-94 would reduce the projected Level 2 peak-hour V/C ratio from 1.45 to about 1.15.

4. IMPROVE FREEWAY CAPACITY

Experience in many U.S. cities has shown that to be most successful, HOV lanes on freeways must be added, and not merely converted from existing lanes. SR-94 offers the best potential for HOV lanes, particularly in connection with reversible lane treatment. HOV lanes could also be installed as additional lanes in SR-163, although not as a low-cost measure. HOV lanes would be less effective on I-5 due to the high number of ramp entrances/exits on the approach to Centre City.

The freeway signing concept has significant potential to divert traffic from I-5 to underutilized facilities at either end of Centre City. At the north end of Centre City, Kettner and India could be signed for downtown access, offering relief to I-5. This will be an increasingly important connection as the Columbia district develops. Signing programs for Pacific Highway have far less potential unless direct connections between I-5/I-8 and Pacific Highway are implemented. At the south end, 28th/National, Crosby in particular and even J/Market could be signed for use by Centre City-bound motorists, encouraging use of Imperial and Market rather than Broadway. SR-163 southbound travelers could be directed off early in

the Hillcrest area to use either Sixth or Fourth/Fifth Avenues. In the longer term, ramp improvements would be needed to support this strategy. Significant deleterious impacts on the Hillcrest area would also occur. It was thus concluded that diversion signing off SR-163 would not be an effective strategy.

5. LOW-COST STREET UPGRADES/CONVERSIONS

Low-cost street upgrades typically include measures as restriping, traffic signalization (installation, retimings), and minor street reconstruction in order to convert a street from minor to major category. Specific improvements evaluated in Package I included the following:

Upgrading of Beech as a major street between Kettner and Sixth - This could potentially offer additional east-west capacity, although it would be difficult to upgrade Beech to an effective major roadway here, as too many conflicting north-south movements take place for access to and across I-5. These heavy cross movements limit the potential capacity of Beech Street.

Upgrading North Harbor Drive to six lanes between Ash and Market - This potential improvement was evaluated for its effect in relieving east-west capacity problems. The principal effect, however, would only be to divert traffic from Pacific Highway, with little overall benefit to the Centre City circulation system.

Upgrading Imperial Avenue to a major two-way street between 19th Street and Harbor Drive - This would be an effective measure providing some relief to east-west traffic congestion in Centre City, as well as improving access to the Convention Center. An improved connection to Harbor Drive would be required, either at Seventh (for the most direct route) or an improved Eighth Avenue connection. Only one railroad crossing would be necessary in this area.

Upgrading Fifth Avenue to a major two-way street between Harbor and Market - This would eliminate the capacity deficiency identified in this area for Level 2, but would provide too much capacity for the projected demand and would be incompatible with the Gaslamp district's heavy pedestrian orientation and sidewalk treatments.

Widening Broadway between Harbor and First - Widening to six lanes (minor reconstruction and parking removal) would reduce V/C ratios but further increase the traffic volumes on Broadway due to the increased capacity available. This measure would thus serve to focus traffic on Broadway rather than spread traffic loads more evenly across Centre City roadways.

Market Street between 19th Street and Pacific Highway - Adding a fifth lane to Market Street by removing on-street parking would also assist in diverting some traffic from Broadway, particularly east of First Avenue, considering the high level of development anticipated south of Broadway and in the Columbia area.

6. CONCLUSIONS

On-street peak-period parking restrictions for the principal one-way streets, and low-cost upgrades for certain of the two-ways streets, offer the most potential of Package I. To a large extent, the Centre City capacity deficiencies identified for Level 2 would be eliminated, particularly north-south surface street access, although capacity problems would remain in the east-west direction, principally along Broadway. The low-cost measures are more applicable to the Centre City system than to regional access corridors. Except for the Centre City signing measure, improvements to the freeways would generally involve higher-cost measures, which were further addressed in Package IV.

C. PACKAGE II - DEMAND REDUCTION AND TRANSPORTATION SYSTEM MANAGEMENT

The transportation actions evaluated in Package II were oriented to management strategies that might reduce the level of automobile travel demand. These actions are thus aimed at reducing congestion and/or increasing efficiency of use of available roadway facilities without adding capacity. They are also primarily oriented to peak-hour travel and thus largely affect work-based trip making.

1. RIDESHARE PROGRAMS

Ridesharing is already a significant travel mode in urban areas across the U.S. The national average automobile occupancy for the journey to work is about 1.2 persons/vehicle, indicating about 30 percent of workers already rideshare. These numbers were largely confirmed locally in a 1983 survey in San Diego which found 24 percent of downtown employees carpooled. There has been significant activity towards rideshare programs in Centre City in recent years such as the Chamber of Commerce Rideshare Incentive Program (1983), Commuter Computer, and the City's Paratransit Section. Public employees offer the highest potential for ridesharing. Caltrans data for example indicates that 55-60 percent of County & SDG&E CBD employees riseshare. Motivating factors for Centre City ridesharing will increasingly include higher parking costs, good transit service, and traffic congestion.

Ridesharing programs are most effective with large employers, a strong lead agency, and when operated in conjunction with other supportive actions. These actions include:

- o Priority parking for rideshare vehicles.
- o Peripheral park-and-ride lots.
- o Vanpool sponsoring/brokering.
- o Exclusive high occupancy vehicle (HOV) lanes.
- o Priority HOV lanes (peak-periods).
- o Metered ramp by-passes.
- o Transit pass subsidies
- o Express bus promotion.
- o Vanpool fare subsidy.

With the exception of priority parking and vanpool programs, these measures are more regionally related, than implementable within Centre City. While rideshare programs can yield quite significant reductions in auto use in the case of large single developments or employers, areawide impacts are usually significantly lower due to the dilution effect across the transportation network. It is estimated that

vigorous on-going rideshare programs in Centre City could reduce the projected Level 2 peak-hour automobile trips into/out of downtown by about 2-4 percent. The highest impact could be expected on the freeway corridors, particularly SR-163 which is forecast to experience the highest congestion levels. An active, centralized, visible rideshare office/program would be necessary to ensure on-going coordination and support of individual rideshare measures, along with extensive employer commitment and support.

2. VARIABLE WORK HOURS

Variable work hours fall into three key categories: staggered (fixed) hours, flexible (flex-time) hours, and a compressed work week (for example, nine-hour days with every second Friday off). The first two types reduce peak-hour demand by spreading arrival/departure times, while the compressed week reduces overall travel. The compressed week has typically received poor responses from employees and is not considered an effective action. Staggered and flexible hour systems are generally favorably received, particularly flexible hour systems which have shown to be the most effective overall strategy. "Flex-time" may actually facilitate car pooling programs as it provides employees more leeway in choosing arrival/departure times.

Variable work hours are most effective at specific locations (e.g., office buildings, transit stops, parking facilities), and in spreading the peak 15-minute period rather than the peak hour. Based on experience elsewhere, it seems that a concerted program of variable work hours for Centre City, sponsored by either a private or public agency could at most effect a 2-4 percent reduction in peak hour vehicle volumes on streets within and into/out of Centre City.

3. PRIORITY ACCESS FOR HIGH-OCCUPANCY VEHICLES (HOV'S)

This action comprises the provision of traffic lanes for the exclusive use of HOV's, including carpools, vanpools, and buses. These facilities are most effective in the regional access system to allow HOV's to bypass freeway congestion. They become less effective close to Centre City due to the high number of entry fixed ramps, and are not practical on surface streets within Centre City.

Experience from numerous HOV lane facilities around the U.S. has shown the most effective installations to be those that added a lane to the freeway, rather than converting an existing lane to HOV use. While impacts of HOV lanes vary widely, overall increases in vehicle occupancy generally range between 5-10 percent following HOV lane installation. Changes in total vehicle volume have ranged from increases of 5 percent to decreases of 10 percent. HOV lanes have typically been most effective when combined with other measures such as fringe-parking, increased transit service and priority carpool parking. Their primary long term impact is focused more on allowing the provision of fast, reliable express bus service to by-pass traffic congestion.

The best candidates for HOV lanes on approaches to Centre City are SR-163 and SR-94, although in both cases lanes would have to be added to these freeways. Express bus service on HOV lanes would be most effective on SR-163 as no light rail line is planned for this corridor, whereas express bus service on the SR-94 corridor would potentially be in competition with the planned East Line light rail service.

4. PEDESTRIAN FACILITIES

The provision of good pedestrian facilities within Centre City is essential both to link together the major activity areas and downtown uses, and to a general perception of Centre City as a desirable place to work or visit. While good pedestrian facilities cannot be expected to have a significant impact on the level of automobile use into/out of Centre City, they are supportive of transit use, ridesharing and peripheral parking, as well as allowing and encouraging the walk mode for trips made within Centre City.

Potential pedestrian facility improvements include special sidewalk treatments, sidewalk widenings, grade separations at major streets, pedestrian-only streets, identification of pedestrian networks, and elevated walkway systems.

The Urban Design Program has already made considerable progress towards the establishment of pedestrian oriented streets, walkways and plazas, into a pedestrian network linking together key Centre City activity areas including the

financial core, Horton Plaza, Gaslamp Quarter, Santa Fe and the numerous waterfront uses. Wherever possible, pedestrians should be oriented away from major traffic streets, although in certain cases this will be unavoidable. Focusing pedestrian routes on the minor streets and/or transit preferential streets allows sidewalk treatments and widenings without vehicle capacity conflicts.

The pedestrian network should be at grade to minimize costs and to maximize the relationship between pedestrian traffic and adjacent land uses (e.g., retail). Extensive elevated walkway systems do not seem to be justified in Centre City due to their high cost and the lack of severly inclement weather. Grade separations at major intersections do not, in general, seem justified either, as those types of facility are seldom used unless linked into more extensive grade separated pedestrian networks or directly into key buildings.

5. BICYCLE FACILITIES

Facilities for bicycle users include designation of bicycle routes, striping of bicycle lanes on roadways, and provision of bicycle parking lockers at the work site with showers and lockers. All these provide a more convenient and secure environment for existing users, and encourage further bicycle use as a travel mode. Certain streets currently designated bicycle routes on the "Centre City Community Plan" (May 1976) include Harbor, Market, Kettner, Hawthorn, Grape, Front, Ash, B and C. In the longer term, though, bicycle routes will be best located away from the key traffic arteries whenever possible (the May 1976 Community Plan should be revised accordingly). They should thus be oriented towards minor streets and transit/pedestrian oriented streets. Bicycle lanes striped in the roadway would necessitate re-striping, which could only be achieved through the removal of one lane of parking. In this context, there are numerous cross-sectional configurations that could incorporate bike lanes into the street configuration, many in combination with bus-only lanes and/or sidewalk widening treatments.

In terms of overall travel demand into/out of Centre City, the provision of bicycle facilities alone would not be expected to have a significant impact on traffic volumes. They would, however, be compatible with and supportive of other TSM measures.

6. AUTO-RESTRICTED ZONES

The concept of auto-restricted zones is to exclude auto traffic from, and/or direct auto traffic around, a key location or area of dense activity and high auto/transit/pedestrian conflicts, in order to allocate street space largely to transit and pedestrians. ARZ's can range in size from a single street to portions of a CBD. Implementation techniques range from restrictive traffic engineering measures to total exclusion of traffic. Effective operation of larger ARZ's while maintaining the economic viability of the area concerned, necessitates other supportive measures including parking supply and location policies and increased transit service in order to maintain accessibility. Even then retail development may be impacted, and the measures may be opposed by downtown businesses.

The effects of ARZ's, in reducing automobile travel into/out of CBD's, increases with the level of restriction and the size of the area covered. Overall ARZ impacts on transportation are especially marked on discretionary trips. Our analysis concluded that ARZ's are not an appropriate policy measure for Centre City, for various reasons. There is insufficient need in terms of roadway capacity or conflict problems; implementation would raise significant operational problems due to the number of parking garages requiring access within the core area; restricting traffic or east-west streets through the core would further exacerbate capacity problems in Centre City; and the regional transportation impacts (reducing auto traffic) would be negligible.

7. CENTRAL AREA LICENSING/TOLLS

Central area licensing programs, such as permit systems or daily entry tolls are concluded to be unnecessary and impractical for Centre City. There is no precedent for such severe measures in any U.S. cities. Such a program would be in direct conflict with goals of developing and maintaining the economic viability of Centre City.

8. CONCLUSIONS

The various elements of Package II have a widespread orientation, largely in providing alternatives to single occupant auto use, or enhancing the non-auto environment in Centre City. Many of these measures are supportive of each other. The cumulative effect in reducing auto demand is usually less than the sum of the individual components, due to some degree of overlap between the measures. The most effective actions for reducing auto travel are those that encourage use of alternatives, specifically ridesharing and variable work hours, rather than prohibit or severely restrict auto usage. Together, it is estimated that vigorous programs in these areas could reduce peak hour vehicle trips by up to about 6-8 percent in the longer term. Many of these measures are particularly effective in that they involve low capital costs and are also supportive of strategies in other packages. While the overall impact of these strategies is clearly significant, the level of impact is considerably less than the capacity increases to be gained from street improvement measures (in Packages I and IV).

D. PACKAGE III - PARKING POLICIES/TRANSIT PRIORITIES

The actions evaluated in Package III were oriented towards parking policies and strategies, and to transit preferential strategies.

1. PRIORITY PARKING FOR HOV'S

This is chiefly a supportive action to the rideshare and HOV priority measures considered in Package II, and would be an important component of any rideshare program. New Centre City developments could be required to provide a certain portion of parking spaces for HOV's. Existing public and private garages could also convert a proportion of spaces to HOV use. Conversion to HOV spaces would lead to a proportionate effect on auto use or parking space need. For example, converting 5% of core area spaces to HOV use (and assuming HOV occupancy of 3 person/vehicle) would lead to a 7-8% increase in person carrying capacity, or a corresponding decrease in the numbers of parking spaces required for the same number of persons served. Reduction in traffic in the road system would be somewhat less, however. The maximum effect from HOV priority parking would be

within the central core area. Its value as a measure would be far less in outer areas of Centre City due to the lack of incentive. This measure would require some degree of enforcement to prevent violations.

2. PERIPHERAL PARKING STRATEGIES

There are three principal types of peripheral parking strategies that could be applied for Centre City. These are:

a. Peripheral parking areas within Centre City.
b. Peripheral parking outside but adjacent to Centre City.
c. Suburban peripheral parking (park-and-ride lots).

a. Peripheral Parking Within Centre City

The goal of this strategy would be to relocate some spaces outside of the core area to outer Centre City locations. The three preferable locations for Centre City peripheral parking are shown in Figure 21. All locations intercept traffic between freeways and the core area, and are in areas that would help focus traffic away from congested freeway access points (e.g., Front/First) or congested Centre City corridors (e.g., Broadway).

This strategy has little effect on the number of automobiles using freeways and ramps to Centre City. Within Centre City, the analysis indicated that removing about one-third of new parking spaces from the core area (that would otherwise be provided there if current practice prevails), would have a marginal effect in relieving Level 2 deficiencies on north-south roadways on the north side of Centre City. Effects on east-west roadways would be varied, reducing volumes on Broadway but increasing them in other locations (Ash, A, G, Harbor). In reality, however, peripheral parking areas on the east side of Centre City would probably be too far from developments west of First Street to be effectively utilized.

b. Peripheral Parking Outside But Adjacent to Centre City

This strategy would focus peripheral parking outside the I-5 corridor. It seems little could be gained as the same traffic levels would use the freeways and ramp systems serving Centre City, but would just park farther away from the downtown. This would also create parking areas, with significant associated impacts, in the more local and residential communities adjacent to Centre City.

c. Park-and-Ride Lots

Suburban park/ride lots are best located to serve trips longer than about eight miles, but less than about thirty minutes travel time. The ideal range then is 8-15 miles from downtown. These lots work best serving either express bus or light rail transit service. Experience in other urban areas has shown that carpoolers using park and ride lots are more frequently destined for suburban rather than downtown locations. The effect of a peripheral parking strategy is probably limited in light rail corridors, as park/ride lots would be an integral component of the light rail planning already well under way in San Diego, and the significant increases in transit riders (four-fold increase) projected in the earlier analysis. The strategy would be most successful in conjunction with express bus service into Centre City in the SR-163 corridor, where no light rail line is planned. Sites on express bus and trolley routes that allow free transit ride for pay parking users or free parking, would be more successful than charging for both parking and transit.

3. PARKING SUPPLY RESTRICTIONS

A parking supply restriction strategy could potentially have the effect of diverting auto drivers to transit. Depending upon the extent of the measure, it could also force Centre City parking into adjacent communities, with significant impacts, or divert travel and destinations away from Centre City entirely. For supply restrictions to be most effective, they would need to be applied to off-street parking in the core area (this is the type and location of the majority of the Centre City parking supply). These restrictions would have to be achieved through implementation of a "parking lid" in the core, maximum allowable parking space ratios, or cost controls (see discussion in next section).

However, in order to actually reduce auto volumes entering Centre City, parking controls would have to be also applied to all areas of Centre City, and maybe adjacent areas too, to prevent simple overspill effects occurring. This level of control would be difficult to achieve, and may make Centre City less competitive with major suburban areas of San Diego, at least in the short to mid-term time horizon.

Control of the overall supply of parking in Centre City would thus probably transfer more trips to other locations than divert to other modes, and alone would not be an effective control strategy. On the other hand, control measures such as maximizing allowable space ratios, applied only to the core area, would be successful in diverting some parking to more peripheral locations within Centre City, and effecting some degree of control over the number of autos accessing the core.

The parcel forecasts prepared for this study assumed a continuation of the current average of 1 space/1,000 gsf provided on-site for office buildings. It was further assumed that the excess demand provided for would be located offsite, split evenly between inside and outside the core area. If new buildings exceeded this current average with regularity, traffic volumes into Centre City would not change, but volumes on core area streets would be somewhat higher than those projected.

Options for limiting future parking supply include both voluntary (incentive), and mandatory. Incentive strategies include rideshare programs/facilities, carpool/vanpool priority and lower cost parking, increased transit usage, and peripherial parking strategies. Mandatory techniques include block limits, parking ratio controls, and parking lid strategies. If parking supply is to be constrained, it is essential that viable alternative options exist, for example rideshare programs/incentives, and improved transit service. The planned trolley lines will provide alternatives for auto use for example, as could adding HOV lanes on SR-163 for express bus and carpool use.

It should be noted that many short-term development projects included in the Level 1 scenario already have parking allocations planned and/or approved. Parking control strategies may thus be less effective in the short-term than in the

longer term. In the longer term, a shift in emphasis from long-term to short-term parking in the core area may be expected. Increasing parking costs, strong rideshare programs, good transit service, and increasing peak period traffic congestion will lead to a lower willingness to park centrally, higher level of peripheral parking within Centre City, and greater use of transit. There will however continue to be a very strong need for short-term parking to support retail and visitor/recreational uses.

Any future control policies will thus need to focus on long-term parking in the core area. Three basic categories of control are available, parking limits by block, parking limits by ratio - related to building site, and an overall parking lid. The first option is very difficult to implement as it is too inflexible and too simplistic, the third option, a parking lid, is politically often infeasible. The highest potential thus lies with a ratio control policy.

The City of Portland for example limits downtown office developments to between 0.7 and 1.0 spaces per 1,000 GSF, depending on proximity to the core. Portland stands virtually alone in also having a parking lid policy although this has been revised upward twice since it was established. While Portland has some of the strictist parking controls on the West Coast, they were implemented partly to control the very serious air quality problem, and in conjunction with an extensive transit mall through the downtown and high bus patronage.

San Francisco discourages any kind of additional parking in the downtown. There is no parking requirement, and parking provision is allowed only up to 7 percent of GSF for offices (equivalent to about 0.15 space/1,000 GSF). San Francisco however has an extremely dense core, and extensive transit service including BART (heavy rail), a trolley system, three regional bus operators, commuter railraod, and an extensive local bus system.

Finally, Seattle is in the process of incorporating parking control measures to the land use code for downtown. The City's general policy to downtown parking is to provide an adequate supply with major incentives for rideshare measures. The City has a minimum requirement of 0.54 spaces/1,000 GSF in downtown, with numerous incentives for providing less, such as increased carpool spaces, vanpool

sponsorship, transit pass subsidies. There is no maximum limit, although supply in excess of 1 space/1,000 GSF is allowed only through an administrative review process.

Two final points should be noted. Firstly, in cities like San Francisco and Seattle, the downtown core is sufficiently dense that the typical office development is interested more in providing less long-term parking. This is partly due to high land values and partly due to the extensive transit systems already in place. (San Francisco recently implemented a one-time $5/SF assessment fee on new downtown office development to help finance transit system improvements). The current San Diego climate is very different in that downtown densities are significantly lower, development in downtown has only recently begun in significant amounts, and incoming developments are in many cases willing to install parking in their buildings. Parking control strategies will thus be more difficult to implement in the short-term than in the long-term.

Secondly, parking control strategies can only be effectively implemented in conjunction with policies of transit improvements, and aggressive rideshare incentive programs.

4. PARKING COST CONTROLS

Parking costs can be controlled directly in public agency operated garages. In order to control costs in privately operated garages, some form of tax levy is necessary (e.g., levy per parked car). This offers the potential for using parking costs to affect the number of people driving into Centre City.

As an extreme example, the travel forecasting methodology indicated that if the average parking rate in Centre City were doubled, a 30% increase in transit usage might result. This would translate into a reduction in auto use of about 5% in daily trips and about 15% in the peak hour. However, this would necessitate not only the ability to control costs of all parking types throughout most of Centre City, but also to be able to raise those costs 100%. Such a degree of control does not seem likely in the foreseeable future. A more likely scenario is that market forces will maintain high prices within the core area, which will encourage a higher degree of

peripheral parking in Centre City, but not significantly affecting the total volume of traffic coming into Centre City.

5. TRANSIT ROUTING

Current and projected bus transit operations focus heavily on Broadway, with significant transfer volume. While more crosstown routes are planned in future years as well as increased Regional Transit Centers outside Centre City, the nature of the bus system is expected to remain largely radial, serving downtown, with continued significant transfers. Bus routing options evaluated in Package III emphasized the provision of corridors through Centre City that minimize bus-auto conflicts, potentially allowing buses to circulate through downtown with less delay.

The analysis indicated limited options in this respect, given bus system needs to serve key destinations, and the roadway configuration within Centre City. Broadway is likely to remain the principal transit corridor as it serves as the ideal transit spine. Dispersion of routes from Broadway across Centre City has many disadvantages including transfer problems, reduced service to high demand locations and the lack of focal points. It also tends to maximize auto-bus conflicts and restricts further the potential for bus preferential treatment. The opposite concept of a transit mall that would accommodate both light rail and buses cannot be implemented within the typical cross-section of downtown streets. Buses are not allowed on trolley tracks, and there is insufficient right-of-way to provide for trolley tracks and two lanes for buses (to enable moving buses to pass stationary ones). The potential for bus-only streets is extremely limited, particularly in the east-west direction. Projected traffic volumes are too high to consider closing Broadway for transit only. C Street already has the trolley, and B, E, and F Streets do not extend through downtown. This, then, places the emphasis on north-south routes through Centre City to relieve bus problems on Broadway.

For Package III, the following bus only streets were tested. Kettner Boulevard between A and Market, Fifth Avenue between A and Market, and E Street between Fourth and Twelfth (see Figure 21). The results were varied. For Kettner, the more heavily used section for traffic will be north of Broadway, largely providing access to Santa Fe and core area parking facilities. Unless a peripheral parking

strategy were implemented, Kettner could not be closed without traffic impacts on adjacent streets. Closing Fifth Avenue to traffic would require conversion of Sixth Avenue from one-way southbound to one-way northbound, which would necessitate engineering work for various garage ramps. The section between A Street and Elm Street would need to be two-way to maintain access from I-5; this would lead to potential capacity problems on Sixth between A Street and Elm.

As traffic volumes increase in Centre City, it will be come increasingly important to offer some form of priority treatment for buses. Based on the preceeding analysis, it seems bus routes (particularly Express Service) could, to some degree, be focused onto two key north-south corridors - Columbia/State, and Fifth/Sixth Avenues - without street closures to auto traffic. The Columbia/State corridor is well placed to serve both the existing financial district, government center, and the new developments expected in the Columbia District. These streets are not expected to carry major auto volumes. Good route connections are possible to both the Kettner/India and Front/First corridors for regional bus access.

The Fifth/Sixth corridor offers the potential for additional north/south routing to the east. The use of Fifth would be appropriate given its heavy pedestrian orientation, and traffic loads will be lighter on Sixth Avenue than on Fourth Avenue.

Less significant impacts would be associated with closing E Street, which could be used either for inbound contra flow bus lanes or as a two-way transit mall. This would have the advantage of removing at least some buses from Broadway, reducing vehicular conflicts, and increased reliability of bus operation through Centre City. Routing eastbound buses on Broadway and westbound buses on E Street would allow transfers without passengers having to cross any streets.

With the radial orientation of bus service expected to continue, a transfer terminal outside of Centre City offers limited potential for reducing through trips in Centre City. Routing buses along E Street, and in some cases the Columbia/State and Fifth/Sixth corridors, does however offer the potential for relocating some key transfer activity off of Broadway. Two potential locations would be Columbia/State/C/Broadway, and Fifth/Sixth between E Street and Broadway

(where buses would jog from E Street to Broadway). In future years, as development levels increase in Centre City, it is not expected that route changes of the type discussed above would impact ridership. On the contrary, improving reliability and Centre City access could increase ridership, as would employer transit pass subsidies.

Two additional trolley corridors are planned for Centre City - north from the existing C Street terminus for the North Line, and south via the Bayside to the Imperial Station. From a roadway circulation viewpoint, the ideal northern alignment would be in the railroad right-of-way in that maximum flexibility would be retained for street system needs. Both Kettner and Pacific Highway will be key entry corridors to Centre City in future years. The projected volumes indicate a long-term need for 3-4 lanes one-way southbound on Kettner north of A Street, a four lane two-way section on Kettner South of A Street, and a six-lane two-way section on Pacific Highway through the area. Earlier studies concluded that additional right-of-way would be necessary for either alignment, although less problems would be associated with the Pacific Highway alignment.

With regard to the Bayside alignment, it is preferable for a trolley alignment to remain north of Harbor Drive, to avoid having to cross the traffic lanes. This will particularly be the case if the Front/First connection to Harbor, and the Imperial Avenue upgrade are implemented. The upgrading of Imperial Avenue to a four lane two-way major street would preclude a trolley alignment along Imperial to the Imperial/Twelfth Station, unless additional right-of-way were acquired. Two alternative trolley alignments would be Commercial Street or along K Street.

The feasibility of a central area bus shuttle system connecting peripheral parking areas within Centre City to key functional areas seems limited, particularly in the short to medium term. The preferred peripheral parking areas are all close to planned trolley stops which might encourage use of the trolley rather than a shuttle bus service (a potential disadvantage of this occurrence would be additional trolley boardings within Centre City where loads are already at their highest from inbound commuters).

In order to be effective, a shuttle service has to operate (and thus at high operating expense) very frequently - at least every 5 minutes or so - otherwise, people will

generally walk the comparatively short distances involved. Given the inconvenience of pheripheral parking and the need to make a transfer of mode, commuters are also unlikely to be willing to pay a shuttle fare (unless perhaps included in the parking cost).

E. PACKAGE IV - CAPITAL PROJECTS

The transportation actions evaluated in Package IV were capital-oriented solutions, focusing on increasing the transportation system supply to meet projected demand levels. In many cases these actions would require new construction activity.

1. MAJOR CENTRE CITY STREET SYSTEM CHANGES AND WIDENINGS

Package IV was oriented to a variety of highway improvements and circulation modifications in Centre City, and hence includes both capital-intensive projects as well as certain low-cost measures from Package I. Principally, the on-street parking restrictions were also included in Package IV because they by-and-large exhibited beneficial circulation impacts, and would be compatible with Package IV improvements.

Certain low-cost improvements characteristic of Package I were also evaluated in Package IV, including upgrading of Seventh Avenue between Market and Ash; Tenth Avenue and Eleventh Avenue between Market and Imperial; "G" Street between Pacific and Fourth Avenue (one-way eastbound); and Market Street from 19th Street to Pacific (addition of fifth lane for westbound use).

The improvements to "G" and Market would help to relieve Broadway. The other improvements proved less effective, partly due to their distance from the core, and also due to the effectiveness of the Front/First connection to Harbor.

Upgrading the Kettner/India couplet and signing Centre City access from Washington will be necessary to provide relief to I-5 and the Front/First ramps, and improve access to the western core. Extending "A" Street between Pacific and Kettner was investigated, but found infeasible for a variety of reasons, principally right-of-way problems, and difficulties crossing the railroad tracks at that

location. On the other hand, connecting "B" Street across the two-block City Concourse, and continuing the one-way westbound treatment (with four lanes during peak periods) all the way to Kettner would contribute significantly toward relieving traffic congestion on Broadway. The analysis also indicated that the extension of Front or First across the railroad tracks to Harbor Drive, thereby continuing the one-way couplet south of Market, would also offer significant relief to east-west routes through Centre City and improve access to the high-activity core from the east and south. This improvement would be particularly effective in conjunction with the upgrading of Imperial Avenue.

2. ADD FREEWAY MAINLINE CAPACITY

The Level 2 deficiency analysis identified the freeway approach corridors to Centre City as being more critical than the freeway segments around (immediately adjacent to) Centre City. With few exceptions there are only limited opportunities for diversion of traffic from freeways to arterial streets.

Package IV tested the addition of one lane in each direction to I-5 north of Centre City, SR-163, and SR-94. Significant reductions in volume/capacity ratios would be achieved, although ratios would remain over 1.0 (see Table 24). Further reductions could be achieved in a variety of ways. It may reasonably be expected that as volumes increase in the longer term the peak hour will spread, effecting a marginal transfer of trips from the peak hour to adjacent hours and a more even spread of traffic over a longer peak period. Secondly, traffic conditions would act as an incentive for increased ridesharing and transit use (particularly LRT which would be independent of traffic congestion). The effect of peak spreading and of a ridesharing/variable work hour program could reduce V/C ratios to the range of 1.0-1.15, depending on the corridor, as also shown in Table 24.

It may also be expected that some diversion to arterial streets may also occur, particularly to Pacific Highway from I-5 if direct connections were implemented. In the SR-163 corridor, significant diversions could not be expected without impacts of through traffic on the Hillcrest Area. Adding lanes to SR-163 also offers the potential for HOV treatment, the opportunity for express bus service to divert some auto users to transit, thus gaining further improvements in the V/C ratio.

TABLE 24. CENTRE CITY FREEWAY ACCESS CORRIDORS
(Peak Hour Volume/Capacity Scenarios)

Scenario	Capacity	Volume	V/C
I-5 at Washington			
Level 2	7,200	10,960	1.52
Add Lane	9,000	10,960	1.22
Peak Spread Adjustment[1/]	9,000	10,410	1.16
Rideshare Reduction[2/]	9,000	9,890	1.10
SR-163 at Robinson			
Level 2	3,600	7,300	2.03
Add Lane	5,400	7,300	1.35
Peak Spread Adjustment[1/]	5,400	6,930	1.28
Rideshare Reduction[2/]	5,400	6,230	1.15
SR-94 at 28th			
Level 2	7,200	10,410	1.45
Add Lane	9,000	10,410	1.16
Peak Spread Adjustment[1/]	9,000	9,370	1.04
Rideshare Reduction[2/]	9,000	8,900	0.99

1/ Assumed 5% reduction for I-5 and SR-163, and 10% for SR-94, based on peak period count data (Caltrans) data.

2/ Assumed 5% reduction for I-5 and SR-94, and 10% for SR-163, based on Package II analysis.

3. ADD FREEWAY RAMP CAPACITY

Widening of both the I-5 Front Street and First Avenue ramps was assumed in Package IV, resulting in significant reductions in the degree of congestion and queuing. Widening of other freeway ramps in the vicinity of downtown is not practical, except the SR-163 ramps in conjunction with additional freeway lanes.

Northwest of downtown, widening of the Kettner off-ramp and India Street on-ramp will probably be necessary in the longer term, in conjunction with upgrading the Kettner/India couplet. In order for Pacific Highway to offer significant relief to I-5, direct connection improvements would need to be made. An analysis of this corridor concluded that direct connections are potentially easier, and offer best relief, north of Washington Street. The preferred locations would be either at the existing Old Town ramps, connecting through to Pacific Highway in the vicinity of Witherby Street, or direct connections from the I-5/I-8 interchange where a wide range of possibilities exist, particularly if other future improvements are implemented at this interchange. This type of connection would also improve access to the airport. In the longer term, it seems that a rear access corridor to the airport from the vicinity of Washington Street should be re-evaluated, to avoid routing airport traffic down Pacific Highway to Laurel.

Southeast of downtown, improvements to the 28th/National interchange with I-5, coupled with a more direct linkage to Harbor Drive, were evaluated. The analysis indicated a significant traffic diversion off of I-5 and onto Harbor. Closer in to Centre City, provision for full movements between I-5 and Imperial Avenue was also tested and resulted in enhanced use of Imperial and Harbor Drive for Centre City core access.

Summary

The following key conclusions from Package IV analyses were drawn:

- Upgrading of east-west corridors through Centre City - the extension and upgrading of "B" Street and the improvements to "G" and Market - will be necessary to accommodate Level 2 traffic and solve

the capacity deficiencies previously identified. These strategies will be particularly significant in relieving Broadway and spreading traffic loads more evenly throughout Centre City.

- Extending Front and First to Harbor Drive provides the potential for Harbor to become a major access corridor from the southeast, potentially offering some minor relief to I-5 and SR-94. It also provides the opportunity of maintaining good core access while routing traffic around rather than through Centre City. These improvements are particularly effective in conjunction with the Imperial Avenue upgrade, and offer improved access to the Convention Centre area. They do, however, require that Harbor between Kettner and Eighth would need to be 6 lanes.

- Additional freeway lanes will be needed on SR-94, SR-163, and I-5 in the northwest corridor, by building new lanes. Ultimately, improved connections between I-5 and Pacific Highway may also be necessary. The analysis indicates that more than one additional lane in each direction on these freeways would not be necessary, although increased ridesharing, use of transit and some diversion to alternative routes would have to take place in addition to providing the additional freeway capacity.

F. SUMMARY OF ALTERNATIVE PACKAGES

A wide variety of action types, component elements and policy-related strategies were examined in testing and analyzing Packages I-IV. No single package or type of action can mitigate all problems identified for Level 2. A combination of improvements, drawing upon all four packages, will be required for the Centre City Transportation Action Program.

The following discussion highlights the major conclusions for each package.

Package I. Incremental Traffic Management

- The most effective action types were on-street parking restrictions for major one-ways, and low-cost street upgrades. Imperial Avenue and Market Street were the most beneficial of the latter category, as they offered some relief to Broadway.

- The package was particularly effective in mitigating Level 2 capacity deficiencies for north-south Centre City streets. It was not so effective, however, in solving east-west capacity problems (Broadway).

- Package I does not address regional access problems, except for the freeway signing program which would be effective along I-5, both southbound and northbound approaches to Centre City.

Package II. Demand Reduction/TSM

- This package has a wider orientation than the first package, in that it addresses non-auto as well as auto-related measures.

- TSM strategies including ride-sharing and variable work hours would be most effective, together yielding a potential 6-8% reduction in peak-hour volumes if vigorously pursued in the longer term.

- Package II has the advantages of being low-cost and of offering an alternative to single-occupant auto use. It also addresses both regional access and Centre City circulation needs.

- Pedestrian and bicycle provisions were found important because they enhance the non-auto environment, but they alone would not reduce auto traffic significantly.

- Extreme measures like auto-related or auto-free zones, central area licensing or tolls would be neither necessary nor effective.

- This package does not reduce travel demand as much as measures in Packages I and IV augment transportation supply.

Package III. Parking Policy/Transit

- The use of parking supply and cost mechanisms as policy measures to control the level of auto use into Centre City would be difficult to implement, and offer only marginal effectiveness in the short term. In many cases, they would need to be particularly restrictive and may direct trips away from Centre City rather than to other modes. In the longer term, as downtown densities increase, and traffic volumes build up, developers may be less willing to provide on-site parking in Centre City developments, and workers may be less willing to pay the higher parking costs that will occur. Some form of longer term parking management program may thus be necessary.

- A variety of Package III measures, particularly HOV priority parking, maximum space ratios and peripheral parking measures, could be effective in encouraging parking in areas of Centre City outside the immediate core. Good Centre City access could be maintained, without bringing in all traffic directly into the central core area.

- Options for transit routing, and particularly preferential treatments for buses, are limited. Conversion of some bus routes (particularly Express Service) to north-south corridors through Centre City (Columbia/State, and Fifth/Sixth), as well as utilizing E Street in conjunction with Broadway, would offer significant relief to bus vehicle conflicts on Broadway, as well as the opportunity for relocating at least some portion of transfer activity off of Broadway.

- It should be noted that conversion of routes currently operating east-west, to north-south alignments through Centre City may involve cost increases (potentially longer routes). Less time spent through delays in traffic may however offset these costs, and improved access times would also benefit passengers.

- Local Centre City transit circulation (e.g., shuttle bus service) would be primarily oriented to midday discretionary trips, and would not offer significant reductions in peak period traffic volumes within Centre City.

Package IV. Capital Projects

- Centre City access and circulation options are effectively increased with the extension of "B" Street through the City Concourse, connection of the Front/First couplet to Harbor, the improved access via Imperial from I-5, and "G" Street and Market improvements. Traffic loadings would be more efficiently spread throughout Centre City, and east-west capacity deficiencies (Broadway) largely mitigated.

- In the I-5 corridor north of Centre City, significant traffic utilization of surface roadways, including Kettner, India and Pacific, would occur. This will require improved signing and upgrading of the Kettner/India couplet and ultimately improved connections between I-5/I-8 and Pacific Highway, north of Washington Street.

- Additional lanes will be required for I-5 north of Centre City, SR's 94 and 163. This alone will not, however, entirely eliminate all capacity deficiencies identified for the Level 2 scenario.

- Strong TSM measures (ridesharing and variable work hours) and "peak flattening" would be effective in reducing the V/C ratio closer to 1.0.

- On SR-94, reversible lane treatment would offer effective additional capacity. On SR-163, an additional lane with HOV treatment, tied in to expanded express bus service, would offer additional "person" capacity and tie in at the regional level with the express bus lanes planned farther north in the I-15 corridor.

V.
TRANSPORTATION ACTION PROGRAM

A. OVERVIEW

The preceeding chapters of this report have evaluated existing and future transportation conditions, identified problems and projected deficiencies, and evaluated various alternative solutions. This chapter describes the assembly of a Transportation Action Program to address Centre City's transportation needs during the next twenty years or so. The program was developed to be responsive to the following overall goal and objectives that were developed during the course of the study.

Program Goal

To provide and maintain a transportation system that ensures adequate access to, and mobility within, Centre City by all transportation modes (vehicular and nonvehicular), and that is supportive of the growing importance and vitality of Centre City's role in the San Diego region as a business, commercial and recreational area.

Program Objectives

To develop a program of multi-modal transportation improvements that will increase the capacity of the Centre City transportation system, will provide for improved access to Centre City in general, and will improve access to and between major activity centers in Centre City.

To maintain, or improve where necessary, the performance of transportation service into and within Centre City, to ensure that current standards will continue to be met.

To implement a transportation program that maintains the visual and physical quality of the environment in Centre City, or improves where necessary to current standards.

To develop and implement a transportation program that is realistically attainable under anticipated future available capital and operating financing, and that is technically feasible while providing flexibility for future modification in response to changing conditions.

To ensure the implementation and effectiveness of the transportation program through a program of participation and supportive policies by both public and private local and regional agencies.

Background to the Recommendations

The transportation alternatives analysis concluded that no single solution package would entirely address future transportation system deficiencies in Centre City. The most effective strategies from each of the alternative packages have been combined into recommendations for a Centre City Transportation Action Program.

It should be noted that these recommendations have been formulated to address the Level 2 development scenario. In that context, many of the recommendations will not require implementation for many years. Certain measures may in fact not be required at all if Level 2 development levels are not realized in Centre City.

The recommendations are comprehensive and broadly based. They address the Centre City street system, entry corridors, parking, transit, pedestrians, and transportation system management. Taken together, they offer transportation solutions that should maintain good access to Centre City, while offering a balance between the various transportation modes. Although not explicitly included in the following recommendations, the Transportation Action Program assumes the transit service provisions to Centre City planned for in the Regional Transportation Plan, including the planned light rail lines for which considerable planning and engineering studies are currently continuing independently of this study.

This chapter of the report identifies and describes the various action program elements, and estimated costs, as well as providing an analysis of funding potential and options, and describing the recommended phasing of the program.

B. ACTION PROGRAM POLICY AND ELEMENTS

The recommendations are summarized by category in Table 25, which lists each principal action, item, and corresponding location within Centre City. The recommendations are also illustrated in Figures 23 through 27 which show the preferred street system, preferred bus network, and bicycle and pedestrian route networks that are recommended for Centre City.

ACTION PROGRAM POLICY

As an integral part of the Transportation Action Program, the following policy guidelines are recommended as an overall structure for the individual program elements.

- Pursue a commitment to a multi-modal transportation system that recognizes the need for maintaining access to and within Centre City for auto, LRT, bus, rideshare, bicycle and pedestrian modes.

- Recognize the key importance of both automobile and transit system capacity in providing access to, and maintaining the economic viability, of Centre City.

- Implement a program that aims to maximize efficient use of the capacity offered by the various modal systems by minimizing the conflicts between them.

- Provide for automobile access by re-defining the preferred street systems in Centre City, and establishing major and collector streets designations for the purposes of focusing traffic flow into defined corridors such that other modes may more effectively utilize other corridors.

- Recognize the fundamental importance of Centre City roadways to the efficient circulation of all modes including transit and walk/bicycle; to prohibit closure of streets on the preferred street, transit and walk/bicycle systems north of Market Street, and to only

consider street closures on these systems south of Market following comprehensive study of impacts and alternatives, and the demonstration of significant and overriding benefits to other Centre City goals/policies.

- Provide for transit access to and within Centre City by defining a preferred transit network to ensure efficient operation and routing of LRT and buses, and to define major bus streets to and bus travel through downtown and transfer activity within Centre City, and minimize conflicts with autos.

- Provide for pedestrian and bicycle movement by defining an identifiable and recognizable network through signing, striping, and special sidewalk treatments; that orients pedestrian and bicycle movements away from major streets while linking together key areas and land uses within Centre City.

- To encourage the use of transit modes and the use of ridesharing modes to provide alternate travel modes and a balanced transportation access system; and through a centralized office to actively support, pursue, and monitor transportation system management strategies.

- Control parking garage access such that garage ramps or entrances/exits are not placed on major bus streets, or streets on the pedestrian/bicycle system; and such that garage ramps do not encroach within the standard 52 foot cross section of Centre City streets.

- Encourage the conversion/provision of proportions of core area parking spaces for rideshare use potentially with reduced parking rates, to support Centre City rideshare program. Also encourage parking provision in identified focused peripheral parking areas outside the main core.

- Work toward a long-term parking management plan for Centre City and the core area in particular, that establishes policy guidelines and specific measures, to provide adequate parking while encouraging use of rideshare programs and transit through incentives.

- Recognize the need for integration of supportive actions/strategies in planning for downtown transportation, particularly the need for transit, rideshare and parking programs to be complimentary and mutually supportive.

- Re-define Centre City's role in the San Diego urbanized area, and recognize Centre City as a legitimate competitor for Citywide and regional funding programs; and to pursue all funding options, both public and private, as means for financing Centre City improvements.

- Recognize the need to implement the action program involves cooperation of numerous public agencies, and consider the potential need for modifications to the existing institutional infrastructure to expedite the action program.

ACTION PROGRAM ELEMENTS

General

The overal intent of the Action Program Recommendations, and the various preferred networks/systems for the different travel modes is thus to minimize inter-modal conflict wherever possible, and to establish priorities for the streets within Centre City. Thus, ideally, any specific street should have one priority function - auto use, transit use, or bicycle/pedestrian orientation. Preferential transit streets for example should not be major auto streets also. Similarly, pedestrian routes should be oriented away from the major traffic flow streets and should focus on the minor or collector streets. In certain cases, due to the particular constraints of the Centre City street and freeway system, it is not possible to strictly separate these modal functions however, and certain streets or street segments may appear on two or even more systems. In these cases it is important to recognize the importance of the streets to both modes. Table 25 lists

the individual actions and projects that are recommended in the Action Program. It also includes a Phasing Plan, by five-year intervals. The Level 1 scenario falls about at the end of the 1985-90 period, maybe extending a little into 1990-95, while the Level 2 scenario extends out to 2000 or 2005. The final element of Table 25 indicates the responsible agencies for each improvement.

Street System

It is recommended that the preferred street system in Centre City be revised to include major streets and collector streets (Figure 23). Design guidelines may then be implemented depending upon function. The major street system comprises those streets designated for principal traffic routes and freeway access corridors. Peak period parking and loading restrictions would be applied to these streets, as well as design guidelines for parking garage access. Streets on the major street systems are thus those expected to carry the major traffic flows within Centre City. The collector street system on the other hand is oriented more specifically for local access and circulation. Collector streets will thus be used for access to/from the major street system, as well as for access to specific lots and parking areas. It should be emphasized that both major and collector streets are vital components of the overall preferred street system.

The existing 52-foot curb-curb section of many downtown streets should be retained for streets on the major street system. This offers considerable flexibility for four traffic lanes, provided parking is removed permanently from one side, and allowed on the other side only during off peak periods. For example, three 12-foot lanes and a 16-foot parking/loading lane (or bus lane) can fit in a 52-foot section. A configuration of three 12-foot lanes and one 11-foot lane would also allow a 5-foot bike lane. In certain cases, when significant sidewalk pedestrian activity occurs, a configuration of four 12-foot lanes in a 48-foot curb-curb section would allow an additional 4-foot of sidewalk on one side, or 2-foot on either side, within the normal 80-foot right-of-way.

Where the existing curb-curb on major streets is less than 52-foot, and redevelopment of adjacent property occurs, the opportunity to restore a 52-foot curb-curb section should be taken. An exmaple would be First Avenue between B and A Streets, where the proposed extension of B Street through the City

TABLE 25. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS

I. STREET SYSTEM

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Revise Preferred Street System	1. Establish Major Street System	(See Figure 23	X				City SD
	2. Establish Collector Street System	(					
B. Re-configure and Re-stripe 1-way[1] Streets on Major Street System	1. Remove parking one-side						
	2. Re-stripe for 4-lane section (three moving and one parking)	(1-way streets on major street system, as necessary	X	X	X	X	City SD
	3. Prohibit peak period parking and loading[2]	(					
C. Re-configure and Re-stripe 2-way Streets on Major Street System	1. Remove parking both sides	(Broadway (Harbor - Pacific)		X			City SD
		(Ash (Harbor - Kettner)		X			City SD
	2. Re-stripe for 3L westbound and 2L eastbound	Market Street (Pacific - I-5)		X			City SD
D. Upgrade Street to Major Street Configuration	1. Change direction of traffic flow from existing preferred street system	G Street 1-way eastbound (Pacific Hwy - Fourth)		X			City SD
		B Street 1-way westbound[3] (First - Kettner)			X		City SD
	2. Minor re-construction, remove stop signs and add signals	Imperial Avenue[4] (Seventh - I-5)	X				City SD
E. Street Widening (reconstruction)	1. Widen from 4L to 6L	Harbor Drive[5] (Kettner-Seventh)		X			City SD
		Laurel St. (Harbor - Pacific)		X			City SD

(Continued . . .)

TABLE 25. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

I. STREET SYSTEM

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
F. New Street Construction	1. B Street through City Concourse[6]	First - Third			X		City SD
	2. Connect Front Street to First Avenue at Island	Front/First/Island		X			City SD
	3. Connect First Avenue to Harbor Drive[7]	First/Harbor		X			City SD/ Santa Fe
	4. Connect Imperial Avenue to Harbor Boulevard at Seventh (close Eighth Avenue crossing)[8]	Imperial/Seventh/Harbor	X				City SD/ Santa Fe
G. Improve Freeway Ramps	1. Widen ramp	I-5 SB off-ramps at Front Street and Kettner[9]		X			Caltrans
		I-5 NB on-ramp at First Avenue[9]		X			Caltrans
		SR-163 on-ramp at and Eleventh[10]		X			Caltrans
	2. Re-sign and improve access.	I-5 SB Crosby Street ramps to/from Imperial.[11]	X				Caltrans/ City SD

(Continued . . .)

TABLE 25. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

II. CENTRE CITY ENTRY CORRIDORS

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Implement Centre City Signing Program on Freeway Approaches	1. Sign financial district and waterfront traffic via Kettner/India and Pacific Highway	I-5/I-8/Pacific Hwy[12]				X	Caltrans/City SD
		I-5/Washington[13]		X			Caltrans/City SD
	2. Sign financial district,[14] waterfront, and Convention Center traffic via Market Street and Imperial Avenue	I-5/Crosby/Imperial	X				Caltrans/City SD
B. Improve Freeway Capacity	1. Add auxiliary lanes (one lane[15] each direction)	I-5 (I-8 - Front/First)	X				Caltrans
	Add auxiliary lanes (one lane each direction or implement reversible lanes)	SR-94 (I-5 - I-805)			X		Caltrans
	2. Add new lanes (one lane each[16] direction with possible HOV treatment)	SR-163 (I-5 - University)		X			Caltrans
C. Upgrade Pacific Highway as Major NW Entry to Central City	1. Conduct detailed study of I-5/Pacific Highway Corridor		X				City SD/Caltrans
	2. Consider direct connection between I-5 and Pacific Hwy	I-5/I-8 interchange				X	City SD/Caltrans
	3. Study rear access to airport from Washington, to relieve Pacific Hwy		X				Port District/ SANDAG/MTDB/ Caltrans/City SD
	4. Consider Pacific Hwy upgrade to 8L	Barnett - Washington or I-5 ramps (depending on airport access options)				X	City SD

(Continued . . .)

TABLE 25. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

III. PARKING

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Restrict On-street Parking on Major Street System and Major Bus Streets	1. Remove parking on one side of one-way streets, and both sides of two-way streets	All streets on major street system and major bus streets	X	X	X	X	City SD
	2. Prohibit peak period parking on major streets	(see Figures 23 and 26)	X	X	X	X	City SD
B. Control Parking Garage Access To/From Major Street System	1. Discourage parking access/egress via bus & pedestrian street system	Streets on pedestrian street system and major bus streets	X	X	X	X	City SD/CCDC
	2. Prohibit future parking garage ramp access from taking a lane in curb-curb roadway section; ensure future ramps merge into roadway section and preserve roadway capacity.		X				City SD/CCDC
C. Focus Parking Supply Additions Outside Core Area Into Preferred Peripheral Parking Zones	1. Establish preferred peripheral parking zones	Railroad/Laurel/I-5/Date	X				City SD/CCDC
		A/Twelfth/Broadway/Ninth	X				City SD/CCDC
		F/14th/Commercial/Ninth	X				City SD/CCDC
D. Provide HOV Priority Parking[17]	1. Encourage proportion of new parking spaces to be designated for HOV use	Within core area (Pacific Ash/Sixth/Market)	X	X	X	X	City SD/CCDC
	2. Encourage conversion of proportion existing spaces for HOV use		X	X	X	X	City SD/CCDC
E. Work Toward Long-Term Parking Management Program for Centre City	1. Develop policy for long-term and short-term parking. Review need for, and type of, controls. Finalize program.	Centre City/Core Area	X				City SD/CDC SD Transit/MTDB/ Chamber of Commerce
	2. Implement program.	Centre City/Core Area		X	X	X	City SD/CCDC

(Continued . . .)

TABLE 25. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

IV. TRANSIT

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Designate Preferred Bus Network	1. Establish Bus Street Network	See Figure 26	X				City SD/SD Transit/ MTDB
	2. Establish Major Bus Streets	See Figure 26	X				City SD/SD Transit/ MTDB
B. Establish Broadway/E as Major Bus Streets	1. Continue routing eastbound buses on Broadway	Fifth Avenue - 16th Street	X				SD Transit/City SD/ MTDB
	2. Route westbound buses via E Street on contra flow bus lanes, connecting to Broadway at Fifth	Fifth Avenue - 16th Street	X				SD Transit/City SD/ MTDB
C. Establish Fifth/Sixth Avenues as Major Bus Streets	1. Focus north-south routes onto Fifth/ Sixth Avenues	Ash Street - Market Street	X				SD Transit/City SD/ MTDB
	2. Bus lane on Sixth Avenue	Ash Street - Market Street	X				SD Transit/City SD/ MTDB
D. Establish Columbia/ State Streets as Major Bus Streets	1. Focus routes onto Columbia/State Streets	Ash Street - Broadway		X	X		SD Transit/City SD/ MTDB
	2. Remove parking and widen sidewalks	Ash Street - Broadway		X	X		City SD/SD Transit/ MTDB
E. Focus Transit Transfers	1. Establish two key bus transfer nodes	(					
	2. Relocate stops to transfer nodes where necessary	(Block of Columbia/C Street/ (State/Broadway (		X	X		SD Transit/City SD/ MTDB
	3. Encourage passengers to transfer at key nodes	(Block of Fifth/Broadway/ (Sixth/E Street (	X				SD Transit/City SD/ MTDB
F. Light Rail Development Plan	1. Regional LRT routes outlined in RTP (1984).	East Urban Line	X				(
		Point Loma Line		X			(
		Mission Valley Line		X			(MTDB
		Oceanside/Escondido			X	X	(

(Continued . . .)

TABLE 25. CENTRE CITY TRANSPORTATION ACTION PLAN RECOMMENDATIONS (Continued)

V. OTHER MODES

Action	Item	Location	Phasing 85-90	90-95	95-2000	00-05	Responsible Agency
A. Establish Pedestrian Route System in Centre City	1. Designate pedestrian routes (comprising key streets, as well as certain mid-block routes)		X				City SD/CCDC
	2. Where possible, widen sidewalks and/or establish special sidewalk/ paving treatments	See Figure 27	X	X	X	X	City SD/CCDC
	3. Implement signing/routing programs to assist in identification and use of pedestrian network		X	X			City SD/CCDC
B. Establish a Funded/ Centralized TSM Office to Coordinate TSM and Promotion in Public and Private Sectors	1. Office would coordinate all TSM and promotion, including: o Rideshare matching o Rideshare promotion o HOV priority programs o Variable work hours Office would be responsible for promotion and initial contacts/ coordination with new downtown developments	Areawide for Centre City - focus on core area (Pacific/ Ash/Sixth/Market)	X	X	X	X	Chamber Commerce/ CCDC/City SD

NOTES:

1/ Should be implemented incrementally, as necessary. Early priority should focus on northside, and I-5 access corridors, as well as Ash, A, F and G Streets.

2/ Requires simultaneous development and implementation of enforcement and tow-away program.

3/ In conjunction with Item I.F.1.

4/ In conjunction with Items I.F.4, I.G.2, and II.A.2.

5/ In conjunction with Items I.F.2, and I.F.3.

6/ Or earlier if City Concourse redeveloped and B Street project can be implemented at same time. Also in conjunction with Item I.D.1.

7/ In conjunction with Item I.E.1.

8/ In conjunction with Items I.D.2, I.G.2, and II.A.2.

9/ In conjunction with Item II.B.1, or otherwise not effective measure.

10/ In conjunction with Item II.B.2, or otherwise not effective measure.

11/ In conjunction with Item I.D.2, I.F.4, and II.A.2.

12/ Only effective if Items II.C.1-4 are implemented.

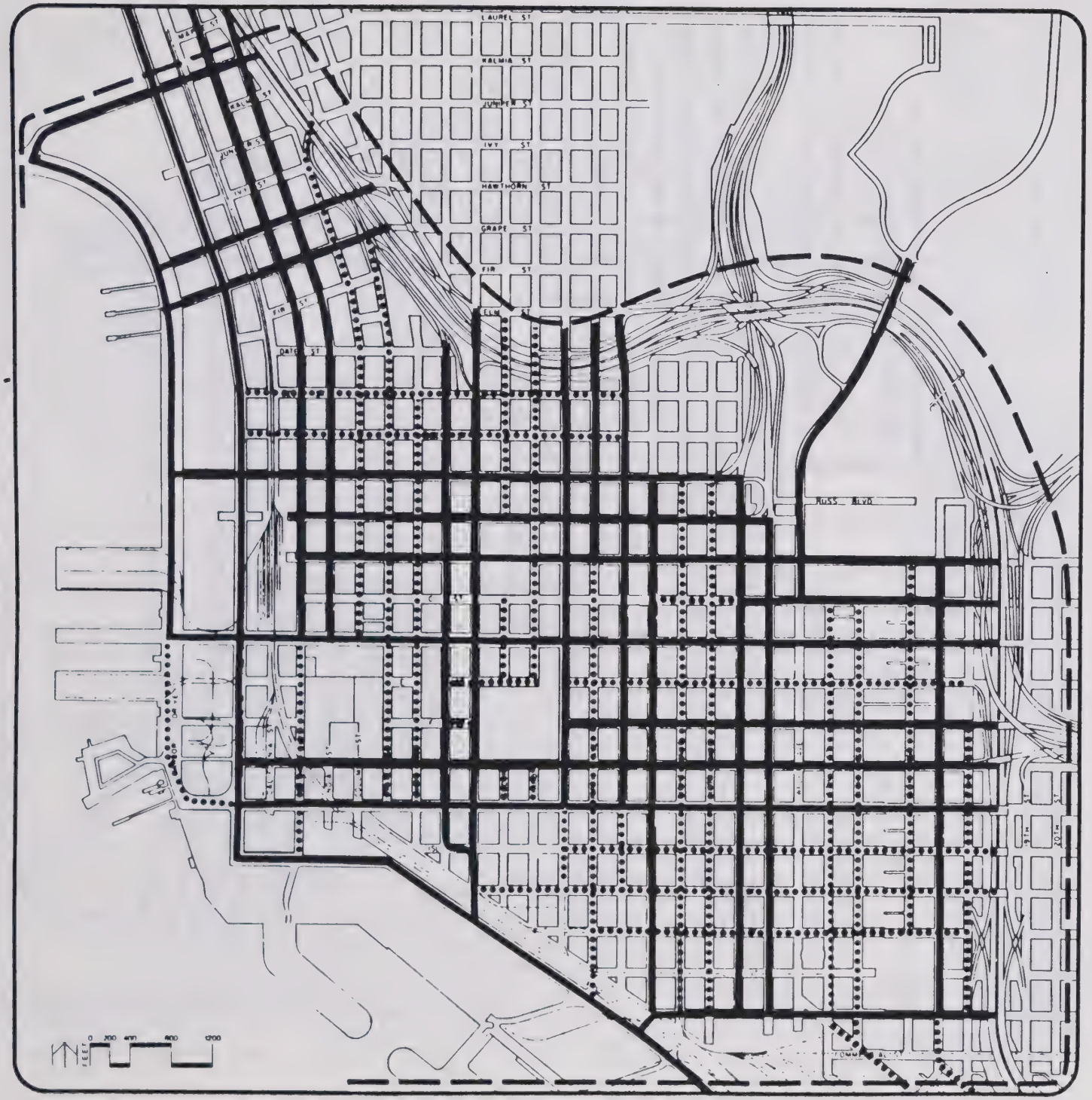
13/ Only effective if Kettner/India couplet upgraded to major streets.

14/ In conjunction with Items I.D.2, I.F.4, I.G.2.

15/ Programmed in STIP for FY87. Needs to be implemented before Item I.G.1.

16/ Needs to be implemented before Item I.G.1 (SR-163 ramp movements).

17/ In conjunction with Items III.C.1 and V.B.1.



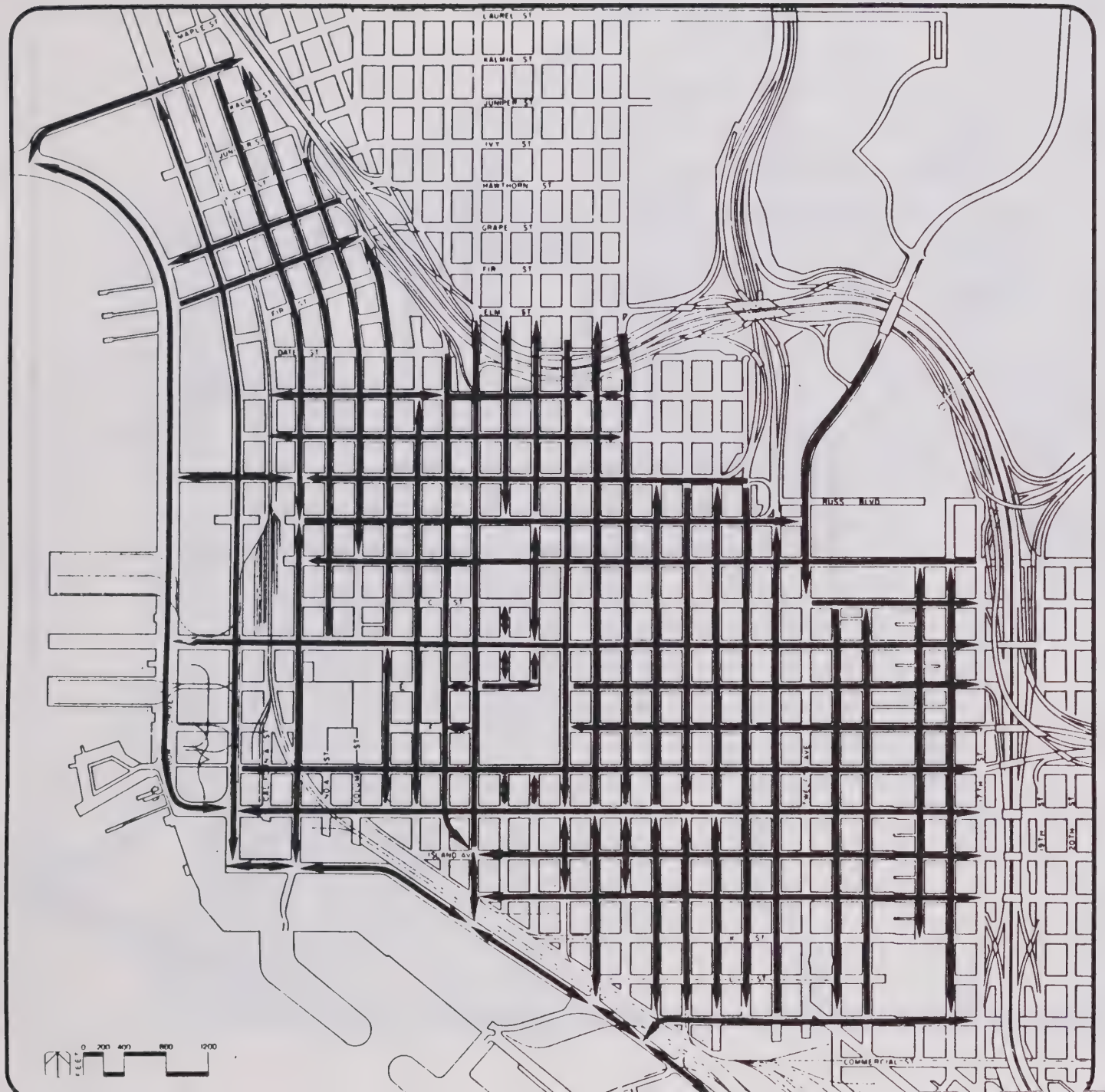
CENTRE CITY
Transportation Action Program

Legend:

- STUDY AREA BOUNDARY
- MAJOR STREETS
- COLLECTOR STREETS

FIGURE 23
RECOMMENDED CENTRE CITY PREFERRED STREET SYSTEM

prc
PRC Engineering, Inc.



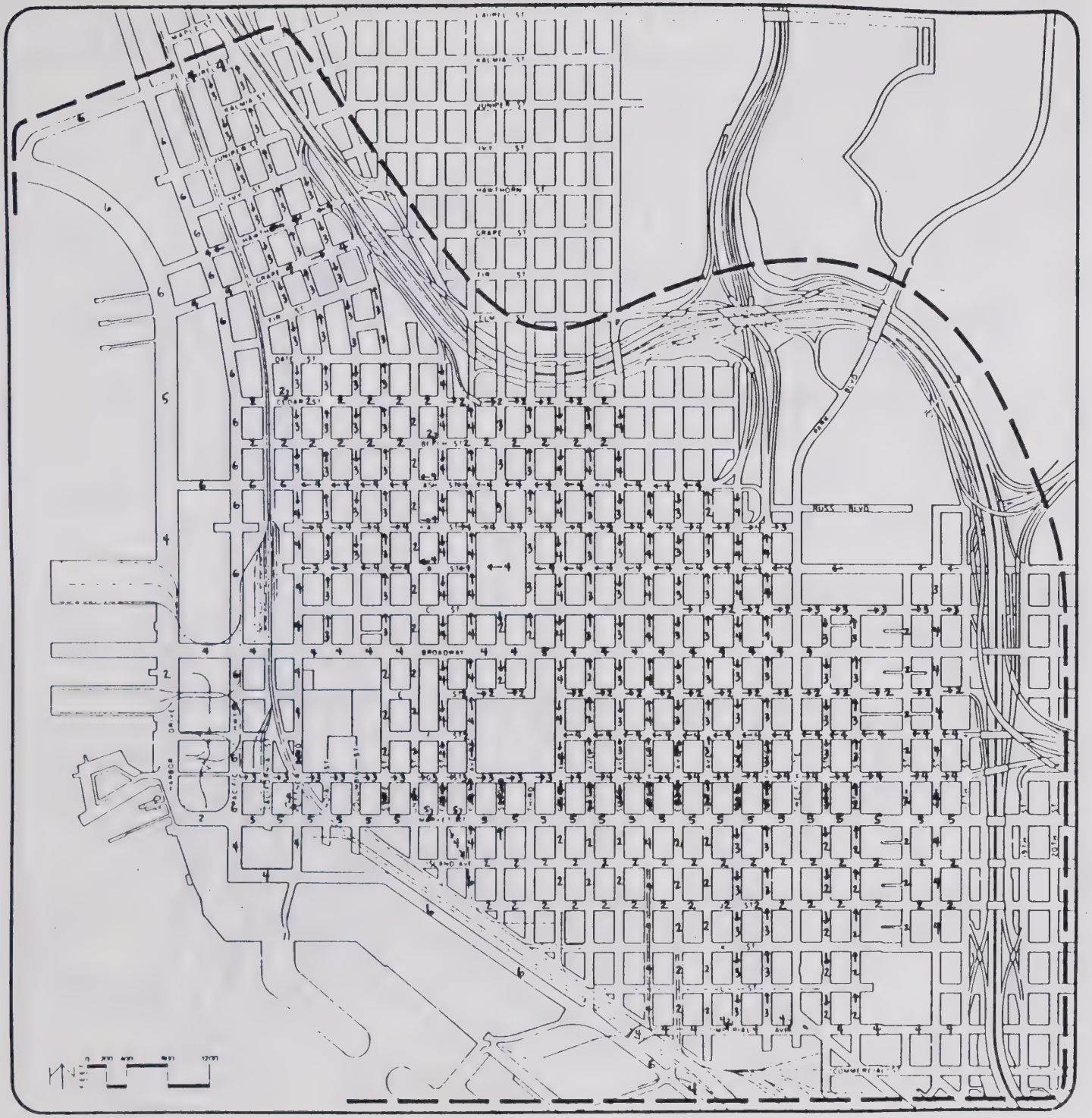
CENTRE CITY
Transportation Action Program

NOTE:

DIRECTIONALITY ONLY SHOWN FOR STREETS ON THE RECOMMENDED CENTRE CITY PREFERRED STREET SYSTEM

FIGURE 24
DIRECTIONALITY RECOMMENDATIONS FOR CENTRE CITY PREFERRED STREET SYSTEM

prc
PRC Engineering, Inc.



CENTRE CITY
Transportation Action Program

NOTE:

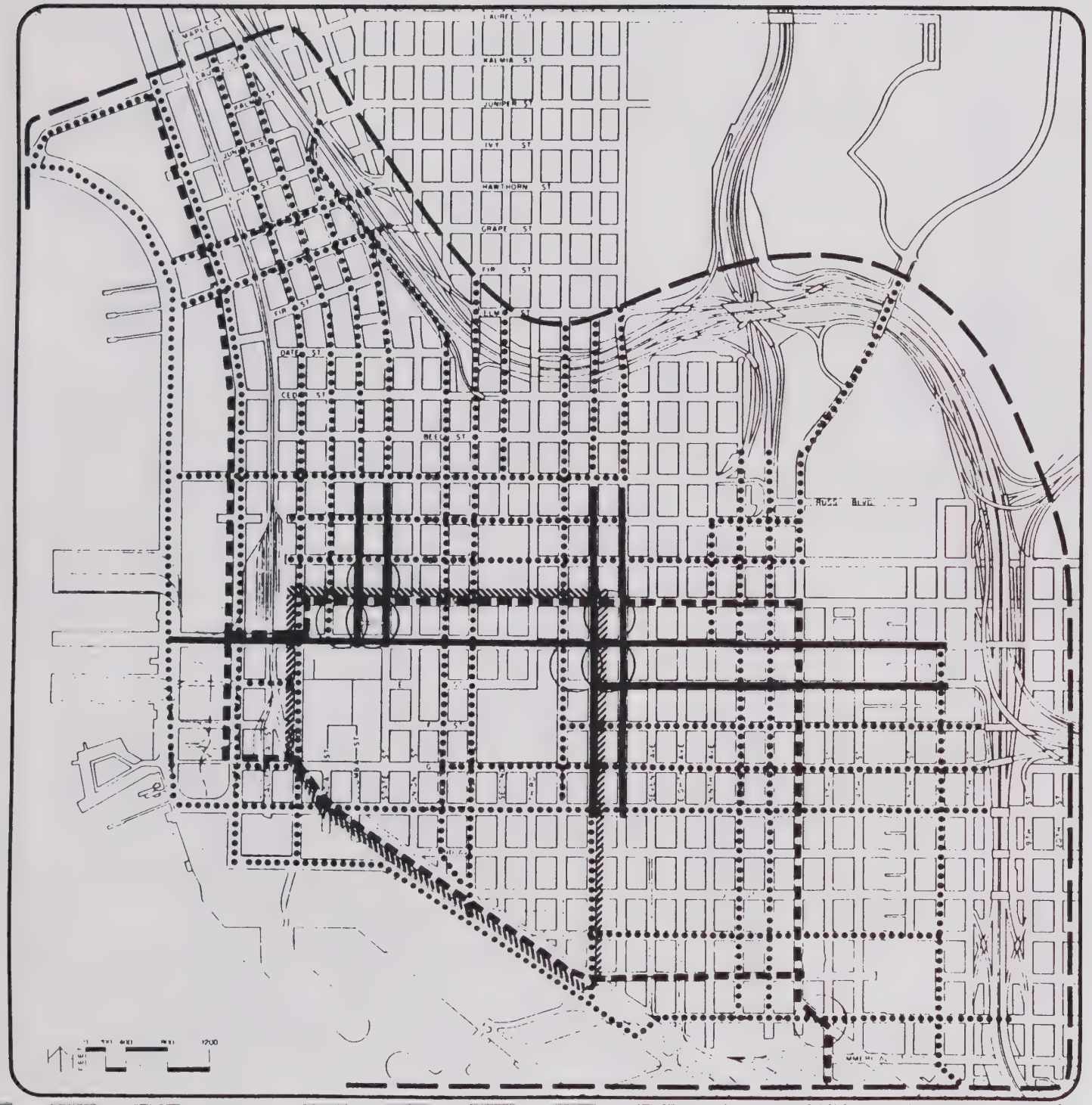
STREETS ARE TWO-DIRECTIONAL EXCEPT WHERE INDICATED

NUMBER OF LANES ONLY SHOWN FOR STREETS ON THE RECOMMENDED CENTRE CITY PREFERRED STREET SYSTEM

THE 4-LANE, 1-WAY STREETS DURING PEAK PERIOD ONLY, OTHERWISE 3-LANE

FIGURE 25
LANE CONFIGURATIONS FOR PREFERRED STREET SYSTEM

prc
PRC Engineering, Inc.



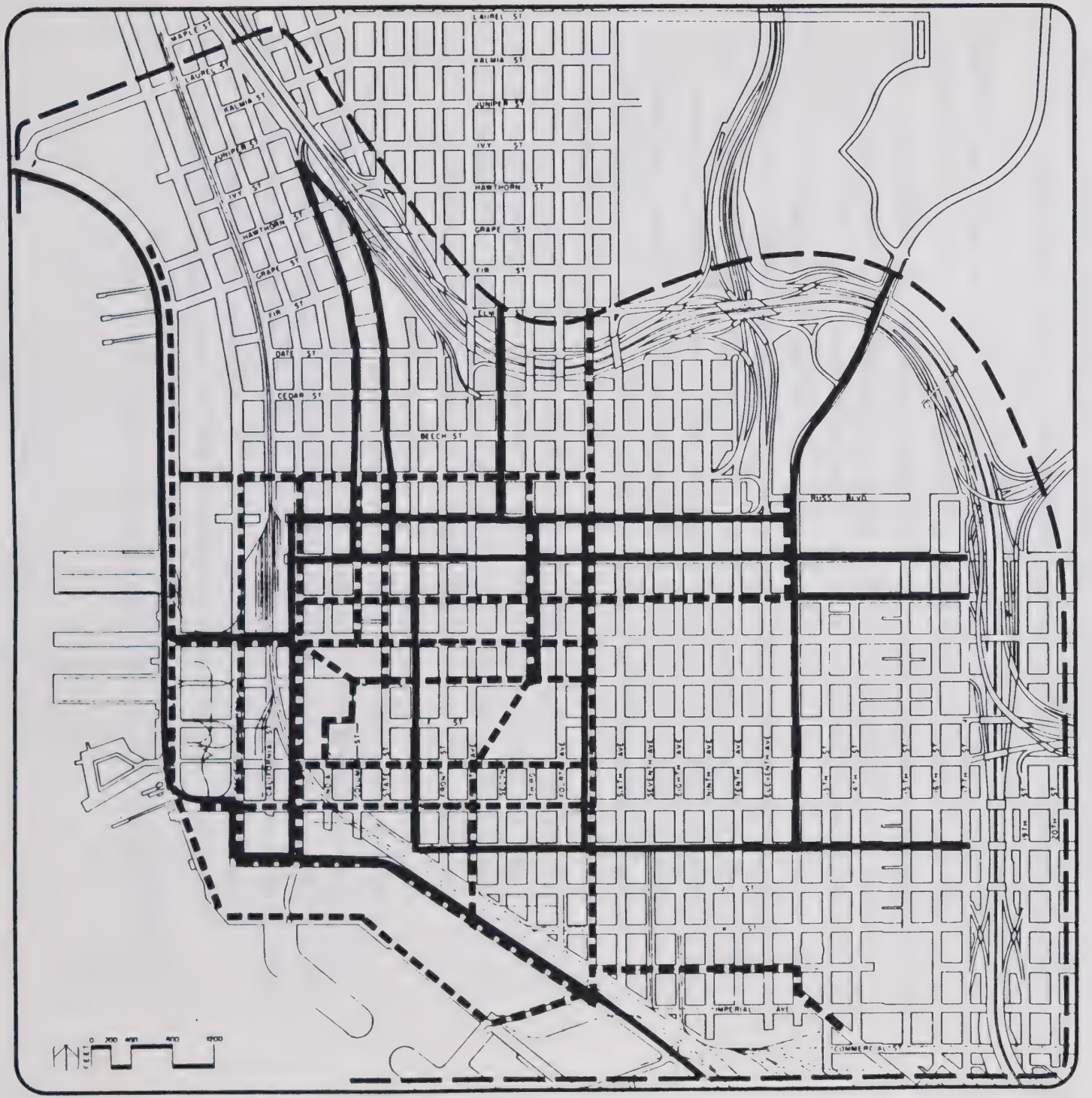
CENTRE CITY
Transportation Action Program

Legend:

- STUDY AREA BOUNDARY
- MAJOR BUS STREET
- BUS ROUTE STREET
- TRANSFER FOCUS
- LRT ROUTE
- GASLAMP TROLLEY

FIGURE 26
RECOMMENDED CENTRE CITY PREFERRED TRANSIT NETWORK

PRC Engineering, Inc.



CENTRE CITY
Transportation Action Program

Legend:

- STUDY AREA BOUNDARY
- PEDESTRIAN ROUTES
- BICYCLE ROUTES

FIGURE 27
RECOMMENDED CENTRE CITY PEDESTRIAN AND BICYCLE NETWORK

prc
PRC Engineering, Inc.

Concourse should also include the relocation or redesign of the City garage ramps on First Avenue.

For collector streets in the preferred street system, a minimum of at least 40-foot curb-curb section should be retained. This will allow sidewalk extensions to up to 20-feet on each side of the street, while allowing considerable flexibility in the curb-curb street configuration. For example, two 12-foot travel lanes and two 8-foot parking lanes, or two 12-foot travel lanes and a 16-foot lane for either off peak parking/loading or as a bus lane. A configuration of two 12-foot and one 11-foot lanes would also allow a 5-foot bike lane in a 40-foot curb-curb section.

The improvements identified for the Centre City circulation system are intended to provide additional arterial entry corridors into Centre City (e.g. Kettner/India, Imperial Avenue) in order to more evenly distribute traffic flows, as well as to improve circulation both around and within Centre City. Peak period parking restrictions on the major streets of the preferred street system offers an effective method of significantly increasing capacity during the peak periods when it is most required. Convenience of on-street parking would remain available during off peak periods. Street upgrade projects such as G Street, Imperial Avenue and Seventh Avenue, along with the new street connections for B Street, First Avenue to Harbor, and Imperial Avenue to Harbor, will also provide for a more balanced street pattern, offering a wider choice of travel routes into and within Centre City, and thus providing key relief to the projected eastwest capacity deficiencies. Clearly, the connection of B Street through the City Concourse would be a significant project. It would entail relocation of the existing fountain, structural modification or demolition of the existing convention facility, and a reworking of the remaining plaza area. Redesign or relocation of the City garage First Avenue ramps would also be necessary. The connection would however provide needed eastwest capacity. Potential alternatives to the B Street connection would be greater congestion on Broadway and other eastwest streets north of Broadway; providing six lanes on Broadway west of Third Avenue by removing parking, (which would add capacity but would focus more traffic onto Broadway rather than spread traffic loads more evenly across Centre City), upgrading Beech Street to a major street west of First Avenue (which would offer improved capacity in the northwest

quadrant of Centre City but not for eastwest movements across Centre City[1]); a major peripherial parking policy or parking limitation policy in the central core area; or a reduction/relocation of the proposed land use densities west of Front Street and north of Broadway.

The proposed extension of the Front-First couplet south of Market Street would also entail an extension across the railroad tracks to connect to Harbor Drive. First Avenue was preferred for this connection due to the capability to link also to J Street, offering maximum flexibility for future circulation options. The additional railroad crossing necessary for this improvement may require relinquishing an existing Santa Fe crossing. E and F Street are both good possibilities as neither are on the recommended preferred street system.

Figure 24 illustrates directionality, while Figure 25 shows the recommended lane configurations, for the preferred street system.

The recommended Preferred Street System shows G Street, Market Street, Harbor Drive, and Pacific Highway as major streets. Currently proposed developments in the Seaport Village area raise the potential need for a re-alignment of Harbor Drive northward between State and Kettner. Evaluation of these schemes was beyond the scope of the current study and will require detailed analysis at some future time. It should be noted, however, that the CCTAP recommendations for upgrading G Street and Market Street, and connecting Front/First to Harbor Drive at least offer the potential for various options regarding Harbor Drive to be considered (e.g., making Kettner the major link to Market rather than the current Harbor-Pacific link, or re-aligning Harbor Drive adjacent to the railroad tracks to intersect with Market in the area of India Street).

Two issues raised in review of the Draft Final Report were the directionality of B Street west of the concourse and the potential lane inbalance between Broadway and Beech, and the potential for Beech Street as a major street on the Preferred Street System. In the Package IV analysis, B Street was tested as one-way

---

(1) Beech Street could not be significantly upgraded east of First Avenue due to the major conflicts that would occur with traffic using north-south roadways to access I-5.

westbound and two-way, for its full length between Kettner and Twelfth. The conclusion was that the overall circulation system operated more effectively with B street 1-way westbound, and that the lane inbalance west of Front Street was not a significant problem (there is currently a lane inbalance east of First Avenue that does not cause significant problems). If, as development occurs, the lane inbalance in fact became significant, a number of options would be available, including the following.

By removing parking on one side and with minor median changes, Broadway could be configured for two westbound lanes and three eastbound lanes between Pacific Highway and First Avenue, B Street could be configured as a two-way, four-lane street between Kettner and First, if development and traffic conditions developed differently to those projected in this study.

Finally, Beech Street could play a more significant role in Centre City circulation. Beech east of First would not be effective as a major due to conflicts with heavy traffic volumes on major cross streets accessing I-5. Between First and Pacific Highway, however, Beech Street could potentially be more effective as a major, either as a two-way, four-lane, or as a one-way, three-lane eastbound. This latter configuration would address the lane inbalance issue discussed above. Beech Street could also be extended through the County parking lot to Harbor Drive, with the potential for Beech 1-way eastbound between Harbor and First, and Ash Street 1-way westbound all the way to Harbor Drive.

While these concepts were not able to be fully tested quantitatively at this late stage in the study, they should be considered as potential strategies that would improve circulation and perhaps assist in diverting some traffic out of the central core area.

Improvements to freeway ramps are propsoed for I-5 southbound off at Front and Kettner, I-5 northbound on at First, and SR-163 on at Eleventh. All these are contingent upon auxiliary or additional lanes being added to the mainline freeway. Improvements to other ramps are not critical, although in the longer term (towards the end of the time-frame considered for this study), widening the I-5 southbound ramps at First and Fifth may become necessary. Widening the First Avenue ramp would not improve volume/capacity conditions on the ramp as it is not possible to

add another lane to the freeway at that point, although an additional ramp lane would increase queing capacity on the ramp and reduce queue backup on First Avenue.

Table 25 also itemizes recommendations for Centre City entry corridors. A signing program is recommended for I-5, to define key sub-areas of Centre City (such as Financial District, Columbia District, Waterfront, Convention Center), and to provide freeway signing specifically to those areas rather than the current general signing which tends to focus traffic onto the Front/First and Fourth/Fifth ramps. Additional lanes are recommended on the I-5 (north), SR-163 and SR-94 freeway approaches to Center City. Concepts of reversible lanes on SR-94, and HOV lanes on SR-163 should be pursued for these additional lanes.

Of the recommended improvements for Centre City entry corridors, the additional lanes on SR-163 are probably the most significant, as it is there that the projected capacity deficencies will be worst. The additional lanes could be built either outside the existing lanes, or in the central median. Advantages of using the median would be easier design, and the potential to make the additional lanes reversible during peak periods. Alternatives to adding lanes were examined during the study and found firstly to be few, and secondly to cause in many cases more impact than SR-163 widening. One alternative would be to use surface capacity on Fourth, Fifth and Sixth Avenues. This would have major impacts on the Hillcrest area, an area already experiencing traffic problems, and would also require major modifications to SR-163 ramps in the area of University and Washington. Another possibility examined was the upgrade of Pershing and a potential connection to I-805. This concept was rejected due to the difficulties of finding an alignment that would not severely disrupt residential neighborhoods to connect to I-805, and because of the significant grade difference that would need to be overcome in an interchange with I-805.

Transit service, particularly express bus, and rideshare programs could reduce auto volumes in the SR-163 corridor. However, such alternatives would have little impact unless additional lanes were constructed to allow buses and carpools to by-pass traffic congestion and offer significant advantages over conventional auto use.

Parking

Recommendations for parking are summarized in Table 25 also. For those roadways designated major streets, restriping to four lanes will require the removal of parking on one side, and peak-period parking and loading restrictions on the other side. This is a measure which would be implemented gradually over time as the need arises on individual streets. It is a common measure in many U.S. cities. It would also require increased enforcement and tow-away policies. Impacts to parkers are limited because on-street parking is mainly short-term, for which the main demand is off-peak, and for which time on-street parking would be permissible. On-street parking restrictions would also lead to some loss of revenue to the City although parking meter operation/maintenance costs would also be reduced.

Control of parking access to/from garages is recommended, with specific regard to ramp placements. Parking access/egress ramps should not be allowed within the curb-curb roadway section. Garage ramps are considered an effective access/egress method to garages, but not when they encroach upon needed roadway capacity. Garage ramps should be designed such that they are parallel to the roadway curb and merge onto the roadway, rather than feeding directly into/from one of the roadway lanes. Sidewalks should be designed on the "inland" side of the ramp to prevent vehicle-pedestrian conflicts. This recommendation is for future ramp designs and is not intended to be retroactive, except in cases where redevelopment occurs or re-design is desirable (from a traffic capacity viewpoint) and feasible (from a garage circulation viewpoint).

The establishment of peripheral parking zones is recommended, in order to focus additional parking provision outside the core area into specific areas, and to orient those areas for close freeway access thus limiting impacts on Center City streets. Three areas are recommended, as listed in Table III-25. The focus of these areas is to be sufficiently outlying such that land costs and development competition are not excessive, while being sufficiently close to the core area of Centre City to be considered convenient by potential users. While all three proposed peripheral parking areas are adjacent to trolley or bus lines, it is probably unlikely that peripheral parkers would use these transit services (these services will probably have limited surplus capacity to accommodate such users anyway, as they will be carrying their maximum loads in Centre City). It is far more likely that people

using these peripheral parking areas will walk the short distances involved to Centre City destinations. Centre City peripheral parking areas further away from the core area than those proposed, were not considered practical due to the longer distances involved, potential need for shuttle service, and the likely lower use of such lots due to the inconvenience of transfers to shuttle service.

There are currently no parking guidelines or requirements for Centre City. This is largely due to the lack of a need, as until recent years there was very little growth activity downtown. More recently significant development has occurred, and rapid growth is anticipated in future years. While today many developers are willing to provide on-site parking, as the downtown develops and land values increase, this willingness will probably decline. Many of the planned projects up to the Level 1 horizon (about 1,990+) already have parking allocation. Beyond the Level 1 time frame, some form of parking management may be preferable. It is, therefore, recommended that the various agencies work toward a long-term parking management program for Centre City. The goal of the program would be the adequate supply of short-term parking, and an evaluation of the need and type of measures for the provision of long-term parking in the core area.

The most successful form of management may be to provide maximum parking ratios on a square footage basis by building type, rather than block limits or a parking lid. An essential part of the program would be the need to integrate such measures with specific policies and action programs for peripheral parking, transit improvemments, rideshare programs, and transit use incentives. At least certain elements of any parking management program would probably need to be incorporated into the CBD Zoning Ordinance.

Transit

A Preferred Bus Network is recommended (Figure 26), identifying streets that are important for bus use. The Preferred Bus Network comprises streets that carry bus routes within Centre City, and is based on existing route patterns as well as anticipated future routing needs. The definition of this network is important to preserve streets for bus routings. Certain streets in the preferred Bus Network are identified as major bus streets. These are streets where the heaviest bus route activity is expected to be focused, and are shown in Figure 26.

The purpose of these Major Bus Streets is to locate routes through Centre City that are off the Major Street System, avoid the highest traffic volume streets, and where some measure of transit preference can be afforded to offer incentives for transit use. Thus the Columbia/State System is recommended because these are designated Collector Streets with correspondingly low traffic volumes, with the opportunity of both provide bus-only lanes, and to extend the sidewalks to enhance the bus loading/unloading and general pedestrian environment. It also offers excellent potential for buses to avoid high volume streets such as Pacific and Front/First, while offering good access to both the existing core area and the planned new developments in the Columbia area, as well as along Columbia and State. Fifth Avenue is similar, in that it is not anticipated to be a high volume street, and already has extensive sidewalk amenities. Sixth Avenue was recommended as the counterpart to Fifth as although it is on the Major Street System, traffic volumes will be lower than Fourth Avenue, and a bus lane can be installed on the west side. This design thus allows the street to be both a Major Traffic Street and a Major Bus Street. Finally Broadway will continue to be a focus of bus activity and has therefore been designated as a Major Bus Street. It must also however function as a Major Traffic Street, with little potential for significant transit priority developments. Nevertheless it has been classified under both categories to demonstrate its importance to both modes and to indicate the need for transit to share equal status with traffic.

As redevelopment occurs along Major Bus Streets, every opportunity should be taken to widen sidewalks, and enhance bus load/unloading areas to minimize pedestrian conflicts. While the joint auto and transit designation is not ideal, it is necessary in a few cases due to the very limited range of options for bus routing patterns through Centre City. Partly to overcome this difficulty with Broadway, a system of eastbound buses remaining on Broadway with westbound buses on E Street in center flow lanes is proposed. This configuration allows passengers to transfer without having to cross any streets, whereas the reverse configuration would require some transferring passengers to cross both E Street and Broadway.

There are a number of possibilities for connecting E Street buses back to Broadway, the recommendation being northbound on Fifth. Continuing west on E Street and using Fourth would require a contra-flow lane on Fourth. This could

not be on the west side of the street because of Horton Plaza access, and on the east side would necessitate a separate signal phase for left-turning buses at Broadway.

Close coordination will be necessary regarding the CCTAP recommendation for the Broadway and E Street bus routings, and the recommendations of the Broadway Bus Accommodation Study. In general, the recommendations are compatible, particularly in the longer term. In the shorter term, three potential conflicts will need to be resolved if the CCTAP recommendations are adopted. These concern the Broadway Bus Accommodation Study plans for bus stop relocation, bus stop improvements, and re-striping for left-turn lanes with curb/gutter improvements. These improvements would still be necessary on the south side of Broadway for eastbound buses. Improvements for the north side of Broadway may need to be relocated to the north side of E Street for westbound buses. This would particularly apply to bus stop improvement measures. The re-striping for left turn lanes should continue to be implemented, and curb/gutter improvements on the north side of Broadway may still be necessary for general traffic even if buses are relocated to E Street.

Establishment of the two key major bus street corridors north-south in Centre City (Columbia/State and Fifth/Sixth) offers the potential for focusing transfer activity on the key areas shown in Figure 26. One is the general area bounded by India/Columbia/B/State and Broadway allowing a key transfer point on the west side of Centre City, but with the potential to relocate some transfer activity off Broadway. This location is adjacent to the C Street trolley terminus with excellent pedestrian connection with C Street to the Santa Fe Depot. Due largely to the planned trolley route on Pacific Highway, and the need for four traffic lanes on Kettner adjacent to Santa Fe, it would be difficult to locate a bus transfer area closer to Santa Fe while minimizing conflicts with auto traffic.

The second transfer focus is the area bounded by Fifth/C/Sixth/E, where the proposed Broadway/E and Fifth/Sixth bus couplets intersect. Again this offers the opportunity to relocate some transfers off Broadway. It also enables good transfer connections with the trolley station in the Fifth/Sixth block of C Street. The third location is the Imperial Station where considerable transfer activity is anticipated with extended trolley operations.

The proposed trolley alignments are also shown in Figure 26, based on analysis undertaken in the current study, as well as the numerous alignment studies conducted by MTDB. North of Broadway, the preferred alignment is Pacific Highway, due largely to the implementational and operational difficulties of connecting into and utilizing the railroad right-of-way; the fact that Kettner will be a Major Street such that a trolley alignment would require extensive property acquisition for the necessary right-of-way; and the relative ease of acquiring the additional right-of-way on Pacific Highway that will be necessary to maintain six traffic lanes in addition to the trolley tracks. South of Market Street, the preferred alignment is north of Harbor, to avoid crossing a high traffic facility, and along L Street to Twelfth Avenue and the Imperial Station. The recommended upgrading of Imperial Avenue to a four lane street precludes a trolley alignment without additional right-of-way. L Street was favored over a Commercial Street alignment due to potential difficulties with railroad tracks, and relative limitations of LRT operation and Imperial Station design associated with a Commercial Street alignment.

The two options available for connecting the north and Bayside alignments are via Pacific Highway or Kettner. Pacific Highway was preferred in order to keep a visible, consistent LRT presence on Pacific Highway, to avoid potential trolley/auto conflicts at the Broadway/Kettner intersection, and to retain maximum future flexibility for Kettner in a traffic context. While Kettner is recommended only as a Collector Street south of Broadway, that status would need to be changed if the Front/First connection to Harbor Drive were not implemented.

An issue of concern raised during the study regarding the trolley was the potential impact that three-car trains stopped at stations may have on cross-street roadway capacity. This issue primarily concerns C Street. It was concluded that the impact is not significant, for the following reasons. The affected streets are Third, Sixth, and Eighth for westbound trains, and Second, Fifth, and Seventh for eastbound trains. Only two of these six streets are recommended as major streets, Sixth and Seventh. The future train headway, by direction, will be about 7 1/2 minutes on C Street. With a typical signal cycle length of 80 seconds, a train will be stopped in a station only every five or six signal cycles, or about eight times per hour. At that time, the cross street may have either a red or green signal indication,

depending upon where in the cycle the signal was when the stopped trolley released the normal signal pre-emption. If the signal is green, then the trolley effectively reduces the capacity of a three lane road by two-thirds, to one lane for about 35-40 seconds which is the typical dwell time. For a four lane street (recommended peak-hour configuration). The street capacity would be reduced by one half to two traffic lanes. This capacity reduction however only occurs every so often, and only affects two streets on the Major Street System.

Figure 26 also shows the Gaslamp Trolley alignment planned by the Gaslamp Quarter Council. This would comprise a loop system utilizing Fifth Avenue, C Street, Kettner, and the Santa Fe corridor back to Fifth Avenue. This route is basically compatible with both MTDB's planned LRT alignments and the CCTAP recommendations contained in this report. For the Santa Fe, Kettner and C Street segments of the loop, the Gaslamp Trolley could share the LRT tracks. A sub-alternative would be to use Pacific Highway rather than Kettner if this were the adopted Bayside route. The CCTAP recommends Fifth Avenue be de-emphasized as an auto street, and oriented towards pedestrian and transit. It will thus be a Collector Street between Harbor Drive and B Street, a Bus Street between Market and Ash Streets, and a pedestrian/bicycle route between Harbor Drive and Ash Street. Between Harbor and B Street, only two traffic lanes will be necessary due to the proposed upgrading of Seventh to a Major Street, with improved connections to Harbor at Imperial.

Based on earlier feasibility studies, the Gaslamp Trolley would run on double tracks in the center of Fifth Avenue, with one traffic lane either side, south of Market. Between Market and Broadway the Gaslamp Trolley would run on single tracks on the west side of Fifth Avenue in a 12-foot wide protected lane. This would leave room for two 11-foot and one 10-foot traffic/parking lanes within the existing curb-curb section, or if three 12-foot traffic/parking lanes were required, the sidewalk would have to be narrowed by about four feet. While more detailed engineering study will be necessary there appears to be a number of options for the Gaslamp Trolley, and local traffic lanes on Fifth Avenue, while maintaining the non-auto oriented nature of the street. North of B Street, Fifth Avenue is an important component of the Major Street System, particularly for freeway access. Any northerly expansion of the Gaslamp Trolley, for example to Balboa Park, would thus be more appropriate on Third Avenue, which will be a Collector Street.

The Gaslamp Trolley will essentially perform a compatible but rather different role to other transit service in Centre City. While regional bus and trolley lines will serve primarily metropolitan area residents' journey into/out of downtown, the Gaslamp Trolley would cater exclusively to movement within Centre City. Ridership of the Gaslamp Trolley would be far more oriented to visitors, shopping and recreational trips, and the impact would be more on-off peak/midday trips than during peak commuter periods. The proposed Gaslamp route would also offer good transfer connections to the regional LRT lines.

Regional Transportation Terminal

While a detailed analysis of the need for, potential benefits of, and best location for, a regional transportation terminal was beyond the scope of the current study, the issue was reviewed in conjunction with the other transportation issues of the CCTAP. The following conclusions were drawn.

The most optimistic configuration of a regional transportation terminal is one that serves Amtrak, national, regional, and local bus lines, and the local LRT System. The principal difficulties are two-fold. Firstly, finding a site that combines all these transit services is very difficult. Close proximity to the Santa Fe depot would be essential in this regard. Secondly, the need to coordinate between all services requires a highly centralized site, and usually land values are prohibitive for use as a transportation terminal. From a cost and regional access viewpoint, terminals in many cases are on the periphery of downtowns.

An analysis of current Greyhound/Trailways service indicated on the order of 150 total (2-way) buses a day. About 75 percent are from/to I-5 north, 18 percent from/to I-5 south, and 6 percent each to/from SR-163 and SR-94. All buses access Centre City via the northside I-5 ramps at Front/First and Fourth/Fifth/Sixth. This, along with the northern orientation of Amtrak, suggest any future transportation terminal should remain north of Broadway, rather than south. The Pacific Highway/Kettner corridor north of the Santa Fe would be advantageous due to good freeway access for regional buses, good LRT access for transfer, and reasonably good access to many local bus lines. Although this corridor seems generally the most promising it would offer only moderate access to Santa Fe, and

relatively poor access to downtown destinations. Tying a regional transportation terminal into the proposed Columbia/State bus streets would probably not be practical due to potential future high land values south of A Street, and poor transfer potential north of A Street.

Finally, if land values or joint development permitted, the area immediately west or south of the Santa Fe depot would offer excellent transfer opportunities, and good downtown access. In any event, careful study of the likely use of such a facility and alternative site locations should be conducted, to establish the need and implications of a regional transportation terminal.

Other Modes

The recommended Pedestrian and Bicyle Network (Figure 27) establishes pedestrian and bicycle routes through Centre City that link together major activity areas and orient pedestrian traffic away from the major street system and onto collector streets or bus/transit streets, where improved pedestrian facilities can best be accommodated. While vehicle/pedestrian conflicts are often inherent in a vital downtown, focusing pedestrian routes onto secondary streets should help to minimize pedestrian flows at major street intersections.

Finally, it is recommended that a funded, centralized TSM office be established to aggressively coordinate and promote all TSM oriented actions and programs in Centre City, both in the public and private sectors. This office would build on and significantly expand upon, the existing efforts of the City's Para-Transit office, and could be funded privately (either through a developer fee or contribution programs). It would actively promote TSM strategies to new Centre City developers, monitor benefits and results from on-going programs, and coordinate activities through a highly visible posture.

Implementation

It should be noted that the improvements included in the action program would require approval of the various authorities involved in Centre City, and that any improvements to the State highway system would require approval of the State

Department of Transportation. Table 25 identifies the agency that would be responsible for implementing each element of the Action Program.

It is also recommended that consideration be given to institutional changes on Centre City inter-agency coordination, that may expedite the implementation of the program. There are numerous agencies actively involved in Centre City, and different elements of the action program will require the support and approval of various of those agencies. Consideration should thus be given to the establishment of a Centre City Task Force. This Task Force could comprise of directors and/or key senior staff of the various agencies. It could be either an advisory body (which might limit its ability to implement the program), or it could be designated varying levels of authority (which however may only in turn trigger the need for further support staff, and the creation of another layer to the existing institutional inf. structure). The most effective format may be a standing advisory committee of agency heads, charged with on-going consideration and resolution of implementation issues, that report broadly supported recommendations to the appropriate agencies for their approval.

Finally, an important part of any long-range plan is the need to monitor progress. On-going data collection, review of performance and re-evaluation of needs on a regular basis are thus strongly recommended.

Shoreline Access

One of the purposes of the current study was the consideration of shoreline access within the overall context of Centre City. The earlier analyses identified that, under the Level 2 development scenario, several shoreline access problems would arise for both auto and pedestrian circulation. High growths in vehicle traffic were forecast North Harbor Drive, as well as increased use of Harbor Drive as an entry route into Centre City from the south. Capacity deficiencies by Level 2 were forecast for certain segments of both North and South Harbor Drive. Also, although several routes are available for accessing North Harbor Drive in an east-west direction, north-south access routes to the southern shoreline are limited, with no roadway extending across the railroad tracks to South Harbor between Kettner and Fifth Avenue, resulting in a projected capacity deficiency on Fifth Avenue north of Harbor Drive.

Pedestrian movements to and from the shore can also be expected to grow considerably. Retail/commercial developments along North Harbor Drive will serve to increase pedestrian activity. The Convention Center and hotel developments, and expansion of Seaport Village along the southern waterfront will generate additional pedestrian activity, both along the shore itself and northward to the Gaslamp District, Horton Plaza and the financial center. Pedestrian access between the downtown core and the waterfront is currently restricted to a few routes, and some of these will likely carry high auto traffic loads on future years (e.g., Broadway, Ash). In the south, there is no direct access from the waterfront to the retail/business core. Pedestrian access, as well as vehicular access, is circuitous to traverse the railroad tracks.

The recommendations of the Centre City Transportation Action Program address these problems directly, and together serve to significantly improve multi-modal access to/from and along the waterfront area.

Roadway improvements, including the upgrading of Imperial Avenue and Seventh Avenue, the extension of Front/Frost to Harbor, and the widening of South Harbor Drive, offer significantly improved access to the southern waterfront from all directions, particularly to the Convention Center. These roadway improvements tend to spread traffic loads more evenly by offering alternative access routes. They also offer greater flexibility in overall waterfront design. For example, the additional capacity provided by the Front/First extension, and by adding lanes to Market and G Streets, allows a variety of options to be considered in the future regarding the potential re-alignment of Harbor Drive in the vicinity of Seaport Village, to allow future consolidation of waterfront uses in that area.

The recommended pedestrian and bicycle network offers significant improvements for access to the waterfront by these modes. The extension of First Avenue to Harbor Drive, along with improved pedestrians facilities will give pedestrians good access between the south shoreline and the business/retail core to the north. Pedestrian routes throughout Centre City are identified and will be appropriately signed, including key access routes along the waterfront (North and Harbor Drive) and to the shore (Ash, Broadway, Market, Pacific, Kettner, First, Fifth). Widened and/or specially surfaced and illuminated sidewalks will also provide for access to the shoreline, as will the recommended bicycle routes also shown in Figure 27.

Multimodal shoreline access will thus be available for commuters, shoppers and tourists alike. Transit access to the shoreline will also be improved in the future, particularly with the Bayside trolley line which will provide both regional transit access to waterfront uses as well as offering local transit service along the waterfront. A Gaslamp trolley service would also provide for local transit access connecting the waterfront with other areas of Centre City such as the retail and financial districts.

C. COST ESTIMATES

Planning level cost estimates were prepared for the recommended improvements and are summarized by major category or action type, in Table 26. The costs are construction-based and involved application of contingency and markup factors above construction unit costs to yield a total "planning" cost estimate in current dollars. Note that right-of-way (ROW) acquisition expenses are included only for widening of SR 163.

Total costs would be on the order of $90-$134 million. The largest part of these costs would be attributable to improvements to the entry corridors to Centre City ($59-$103 million). The range of costs depends on whether auxiliary lanes on I-5 and SR-94 are obtained either by use of existing shoulders (approximately $2 million) or widening and reconstruction (approximately $45 million). Clearly there is a significant difference in costs between the two approaches. The re-striping and use of narrow lanes may only be acceptable to Caltrans and FHWA if considered a temporary or interim measure, to be followed at some future time with permanent reconstruction.

For improvements within Centre City, street system costs total almost $19 million, transit facilities about $2.5 million, and other modes almost $10 million. Detail of the cost estimates are included in Appendix E, for individual action items in the transportation improvement program.

D. FINANCING

Numerous existing funding sources were identified and examined for applicability in funding the Transportation Program improvements. Principal federal, state and

TABLE 26. COST SUMMARY FOR CENTRE CITY TRANSPORTATION IMPROVEMENTS

Category	Cost
Street System:	
Local Streets and Roads	$ 9.0 million
Freeway Ramps	9.8 million
Subtotal	$ 18.8 million
Centre City Entry Corridors:	
Interstate System	$ 2.6 - 30.1 million (1)
State Highway System	29.3 - 45.5 million (1)
Local Streets and Roads	27.2 million
Subtotal	$59.2 - 102.8 million
Transit:	
Local Centre City	$ 2.5 million
Regional LRT	$ (753 million) (2)
Other Modes:	
Pedestrian	$ 6.3 million
TSM/Rideshare	3.5 million
Subtotal	$ 9.8 million
TOTAL	$90.2 - 133.9 million

(1) The higher figure for addition of auxiliary lanes for I-5 and SR-94 assumes reconstruction full standard freeway cross-section. The lower cost estimate provides for no reconstruction and would require use of existing shoulders, re-striping and re-dotting.

(2) Capital costs only. Not included in total due to regional nature of LRT system.

local governmental programs are listed in Table 27, and checked for eligibility for use on Centre City-related highway and/or transit capital improvements. Those governmental funding sources found potentially applicable to the Centre City improvement program are described in Table 28.

Discussions were held with several officials from Caltrans, the regional planning authorities and City staff, relative to such critical issues as:

- Priorities of Centre City vis-a-vis other City or regional transportation needs;
- The likelihood of using a particular funding source for Centre City; and
- The "assuredness" of given funding sources over the longer-term.

Coupled with review of the literature, and considering the cost estimates involved, the information obtained from these discussions was used to rate the potential for use of the existing funding programs on Centre City-related improvements. These results are displayed in Table 29.

The analysis indicates that local street system requirements, including widening of certain I-5 ramps, can be met over the 20-year plan horizon without a funding shortfall. Funding the ramp improvements with Federal Aid Interstate FIR monies assumes Caltrans support of these projects. Assuming continued regular use of General Fund (Capital Outlay) monies for City highway improvements, continuation of PUC RR crossing grants, and a moderate priority upon Centre City needs over the years, the local street system requirements should be met. The same is concluded for local Centre City transit capital needs (several funding sources) and I-5 signing and auxiliary lane improvements (again FIR for I-5).

Funding for local Centre City transit capital projects (such as transit stop/waiting area improvements, transit lanes, etc.) should be available from a variety of sources, including TDA funds, and would be ideal recipients of funds from development fee or assessment district sources. Transit routing changes may

TABLE 27. APPLICABILITY OF CURRENT CAPITAL FUNDING SOURCES SPECIFICALLY FOR CENTRE-CITY RELATED CAPITAL IMPROVEMENTS (1)

Funding Source	Highway	Transit
FEDERAL SOURCES		
Federal Aid Intersatate - FAI	No	No
Federal Aid Interstate - FIR	Yes	No
Federal Aid Primary - FAP	No	No
Federal Aid Urban - FAU	Yes	Yes
Federal Aid Secondary - FAS	No	No
UMTA Section 3	No	No
UMTA Section 9	No	Yes
UMTA Section 16(b) (2)	No	No
UMTA Section 18	No	No
STATE SOURCES		
State Transit Assistance (STA)	No	Yes
State Guideway Program	No (2)	Yes
State Highway Account (SHA)	Yes	Yes
State Public Utilities Commission (PUC)	Yes (3)	No
LOCAL SOURCES		
Transportation Development Act (TDA)/ Local Transportation Fund (LTF) (4)	No	Yes
General Fund (Cities and County)	Yes	Yes
Fuel Tax Subventions	Yes	Yes
Community Development Block Grants	Yes	Yes

(1) Pedestrian facilities may normally be provided, if part of the principal highway/transit improvement project.

(2) Exclusive guideway busway/HOV projects may be funded under this program.

(3) This is a State PUC grant program specifically to fund new or improvements to existing railroad-highway crossings, whether grade-separated or at-grade.

(4) Pedestrian and bicyle facilities are specifically included under this program.

TABLE 28. CURRENT CAPITAL FUNDING SOURCES SPECIFICALLY APPLICABLE TO CENTRE CITY-RELATED CAPITAL IMPROVEMENTS

Source	Description
FEDERAL SOURCES	
Federal Aid Interstate - FIR	This is the Federal Aid Interstate "4R" program which covers improvements to existing Interstate sections, e.g., I-5. Addition of auxiliary lanes, new ramps or connections if beneficial to the freeway, ramp widenings are eligible. The Federal share covers 80 percent of project cost.
Federal Aid Urban - FAU	Covering new construction or improvements to existing State highways, local streets and roads designated on the FAU system, the Federal share covers 80 percent of project cost. In San Diego a local allocation committee controls FAU money, with Caltrans allowed to use about 30 percent of this fund on FAU-designated State highways (SR's 94, 163 and many others), with the remaining 70 percent allocated among local jurisdictions. Principally oriented to highway needs, local jurisdictions may, however, opt to use part of their allocation for transit and ridesharing improvements, in lieu of local roads on the FAU system.
UMTA Section 9	Administered by the Urban Mass Transportation Administration, Section 9 monies are allocated to urbanized areas on a formula basis. Transit operating and capital projects are eligible. Among many others, capital improvements may include transit malls and related pedestrian enhancements, transfer facilities, intermodel terminals, bus shelters and information displays, and highway-related measures such as contra-flow bus lanes.
STATE SOURCES	
State Transit Assistance	In existence since 1979, funds for this program are derived from the Statewide sales tax. Funds are allocated to regions by formula on the basis of transit operators' revenues and population. Marked by declining revenues, the STA is funded by allocations from the State Transportation Planning and Development (TP&D) account. Transit capital and operating programs are eligible.

(Continued)

TABLE 28. CURRENT CAPITAL FUNDING SOURCES SPECIFICALLY APPLICABLE TO CENTRE CITY-RELATED CAPITAL IMPROVEMENTS (Continued)

Source	Description
STATE SOURCES (Continued)	
State Guideway Program	Made up of a combination of funds from the State Highway Account and the TP&D account, State Guideway funds are available in counties, including San Diego County, which have passed an enabling ballot measure. Transit operators are eligible applicants, and eligible projects include planning, right-of-way acquisition and construction of exclusive transit guideway projects including busway/HOV facilities and passenger rail projects.
State Highway Account	The State's share of the State gas tax is deposited in this account, and used to fund highway maintenance requirements, highway and transit capital improvement programs.
State PUC	The California Public Utilities Commission has a grant program for railroad-highway crossing improvements. The Commission annually solicits grant applications from interested agencies and RR authorities. Designed to benefit both railroad operations and highway circulation, projects can be for new or improvements to existing crossings, and may be grade-separated or at-grade. Costs are split 80 percent PUC/10 percent local/10 percent railroad.
LOCAL SOURCES	
Transportation Development Act/Local Transportation Fund	The Transportation Development Act (TDA) provides a major funding source for public transportation. Revenue derived from 1/4¢ of the 6¢ retail sales tax is collected and returned to each county for deposit in the Local Transportation Fund (LTF). Whereas the bulk of the monies is allocated to transit operators to cover their operating and capital requirements, a small portion may be used for pedestrian and bicycle facilities.
General Fund	The General Fund (cities and county) consists principally of monies collected from property taxes, and federal revenue sharing allocations. In the case of the City of San Diego, federal revenue sharing monies have been combined with "Capital Outlay" funds, and some $9-$13 million (average $10-$11 million)

(Continued)

TABLE 28. CURRENT CAPITAL FUNDING SOURCES SPECIFICALLY APPLICABLE TO CENTRE CITY-RELATED CAPITAL IMPROVEMENTS (Continued)

Source	Description
LOCAL SOURCES (Continued)	annually has been made available for local road and street improvements over the last several years. Transit improvements can be funded out of the General Fund as well.
Fuel Tax Subventions	Nearly half of the 9¢ per gallon State gas tax is subvened to local jurisdictions. Funds may be used for highway and transit capital improvements. The City of San Diego uses nearly all of this type fund to cover highway maintenance requirements.
Community Development Block Grants	The Community Development (CD) Block Grant program, administered by the Federal Housing and Urban Development Department, makes limited funds available for projects in "eligible" (generally low-income) areas. Requiring an application annually, grants may be used for transportation improvements if deemed beneficial to the target area. For example, the City of San Diego has lately been receiving about $1 million each year to fund a costly project to widen San Ysidro Blvd.

TABLE 29. RATING OF POTENTIAL FOR USE OF EXISTING FUNDING SOURCES SPECIFICALLY FOR CENTRE CITY-RELATED IMPROVEMENTS

Improvements	Federal Government Sources	State Government Sources	Local Government Sources	Likely Shortfall?
I. STREET SYSTEM				
A. Local Streets and Roads	Low	Medium	Medium	No
B. Freeway Ramps	Medium	Medium	Low	No
II. CENTRE CITY ENTRY CORRIDORS				
A. Interstate System	Medium	Medium	Low	No
B. State Highway System	Low	Medium	Low	Yes
C. Local Streets and Roads	Low	Low	Low	Yes
III. TRANSIT	Low	Medium	Medium	Possible
IV. OTHER MODES				
A. Pedestrain	Low	Low	High	Yes
B. TSM/Rideshare	Medium	Low	High	No

(1) See Table 25.

result in changes in operating costs which would probably have to be funded from the same sources or anticipated sources that are used for general bus operating costs throughout the metropolitan area.

Shortfalls may be expected, however, for Centre City entry corridors on both the State Highway System and the local road system (Pacific Highway). The auxiliary lanes for I-5 may be fundable, using FIR, if the low-cost re-striping approach is utilized. However, it is probable that FHWA may not fund such a strategy without a firm commitment from the State to restore the highway to full standards at some future time, which would ultimately mean widening. The improved connections to Pacific Highway from I-5/I-8 could conceivably be funded under the Federal Aid Interstate FIR program, given that the improvements would be beneficial to I-5 by diverting traffic off the Interstate. But the considerable cost (over $25 million) makes this unlikely, particularly in consideration of other FIR priorities. SR's 94 and 163 are designated FAU in the vicinity of Centre City, and would thus be in keen competition over FAU funds.

Adding low-cost auxiliary lanes to SR-94 with re-striping could probably be funded out of FAU during the plan horizon. It seems however that neither the high-cost reconstruction option for SR-94, nor the widening of SR-163 is likely to be funded with FAU monies as there are too many state highways of regional significance already in the regional transportation plan, critically needing construction funding.

Pedestrian facilities are another area where funding shortfalls may be anticipated. Some - but certainly not all - pedestrian enhancements can be provided as part of other capital projects (like implementation of bus transfer facilities or as an integral part of new building developments). It seems that few federal or state dollars will be available to fund significant portions of pedestrian facilities however.

Overall, very likely half - or somewhere in the neighborhood of $45 million - of the total improvement costs may not be fundable without additional funding sources. This figure assumes that I-5 and SR-94 auxiliary lanes will be accomplished with low-cost re-striping. (The prognosis would be considerably worse if costly re-construction were to be provided.)

The regional transit improvements relating to Centre City have not been included in the preceding analysis due to their considerably broader geographic orientation. The following discussion provides an overview of funding for the regional transit plan. Funding for the regional LRT system, as well as other transit capital/operating costs, is uncertain at this time due to potential reductions in both federal capital and operating funding for transit. The 1984 RTP analysed six alternative transit funding sources, and concluded that a secenario representing a Continuation of Existing Programs was the most likely. Under this scenario, while continued state and federal funding is uncertain, it does seem probable, although not to fund the majority of the region's transit capital and operating costs. Under the most likely scenario, the RTP identifies a total FY84-2005 transit capital cost of approximately $1 billion (with $753 for trolley construction), and an overall capital revenue shortfall of $418. It also identifies total FY84-2005 transit operating costs of about $2.2 billion, with an operating revenue shortfall of $118 million. The RTP concludes that a local sales tax would thus be warranted to support implementation of the regional Long-Range Transportation Plan and that a 1/4¢ sales tax would provide sufficient revenue to cover projected transit capital and operating costs.

Potential new funding sources will thus need to be considered, and two sources would seem to merit the most attention for Centre City. One is the local option sales tax; the other various fees and exactions levied on Centre City private property owners and developers. Table 30 shows that the burden of an increased sales tax would fall on the general population. Considerable funds could accrue for transportation improvements, however, which could be applied towards local roads, freeway reconstruction and bus transit needs. In fact, consideration is presently being given to a 1/2¢ ballot initiative in San Diego County, to be split equally for local roads, transit and State highways. The regional planning authorities forecast that some $3 billion in constant dollars would be generated for San Diego County over a 20-year period. Part of these funds could reasonably be expected to be channeled towards Centre City projects.

The other option would be development fees for new projects constructed in Centre City. Such fees are increasingly becoming a fact of life for many new development projects elsewhere in San Diego, as well as many other parts of California which

TABLE 30. GREATEST POTENTIAL NEW FUNDING SOURCES/MECHANISMS SPECIFICALLY FOR CENTRE CITY-RELATED CAPITAL IMPROVEMENTS

New Funding Sources/Mechanisms	Primary Burden Group	Highest Potential Application		
		Streets and Roads	Freeway Reconstruction	Bus Transit
Local Option Sales Tax	General Population	X	X	X
Development Fees	Property Owners	X		X
Benefit Assessments	Property Owners	X		X
Tax Increment Financing	Property Owners	X	X	

share infrastructure funding problems. Levies upon Centre City property owners/developers could be reserved exclusively for Centre City-related improvements. This compares favorably with the competition that would characterize use of a sales tax-based account. These fees could contribute to funding many local transportation improvements in Centre City, including improved transit facilities, pedestrian and bicycle measures, as well as TSM programs and Centre City street improvements. Other funding options should also be explored with a view to obtaining as many sources as possible. For example, advertising revenue may help in reducing the cost of transit shelters or loading areas in Centre City.

While there are currently no mechanisms in Centre City for development fee programs, there are some assessment districts that fund certain landscaping, street lighting, and pedestrian facility installation and maintenance. A more formal or widespread program may be operable through setting up a Facilities Benefit Assessment District, through changes to the CBD Zoning ordinance, or within the Urban Design Guidelines. The selection of the most appropriate mechanism will be important because many of the action items in the CCTAP could logically be funded through impact fees and assessment districts, including many Centre City street improvements, ramp improvements, freeway signing, parking measures, transit facilities in Centre City (Bus lanes, sidewalk improvements, transfer facilities, bus stops/shelters), pedestrian/bicycle facilities, and a TSM/rideshare office and program.

In conclusion, it is clear that Centre City is, in many cases, in direct competition with other areas of both the City and County for funding sources. A re-assessment of City/County wide priorites may thus be necessary to ensure that Centre City projects receive the appropriate priority. It is also evident that many other capital projects elsewhere in the region are either already on funding programs, or are "in line" for those programs. As Centre City transportation planning has fallen behind in the regional perspective, unless regional priorities are significantly charged or re-ordered, Centre City projects will essentially join the back of the funding queue. This indicates that funding could well be more difficult in the near future than on the longer term. In this context, alternative funding sources seem particularly attractive in that they would provide funds earlier, and

in line with development as it occurs in Centre City. It should be noted that SANDAG currently has a Transportation Financing Advisory Committee, comprising locally elected officials, that reviews countrywide transportation financing needs and means available to meet those needs. This committee could play a significant role in developing future financing mechanisms for Centre City transportation projects.

E. SUMMARY

This final report chapter has described an overview of the Centre City Transportation Action Program developed as a product of this study, a detailed breakdown of policy and project items recommended, a summary of projected costs, and an evaluation of financing options.

The following discussions summarizes the recommended program, in relation to the principal objectives established earlier in the study.

Multi-Modal Access

The recommended CCTAP is a balanced, multi-modal plan with proposals for improvement to highway systems (Centre City access corridors, Centre City street improvements, signing programs, and ramp improvements), transit systems (regional access improvements, particularly trolley service, transit facilities and priority measures within Centre City), parking measures, pedestrian and bicycle systems, and rideshare/TSM programs. The recommended system and networks are integrated to allow good circulation for each mode, while minimizing conflicts between modes.

Access To and Between Major Centre City Activity Centers

The CCTAP is responsive to this objective in that it provides for improved bus corridors through Centre City, recommends pedestrian and bicycle networks away from major traffic streets wherever possible and which provide strong access links between the core area and the waterfront, incorporates the Bayside LRT line, and

the Gaslamp Trolley, as well as highway improvements both to increase roadway capacity on major streets and new links to improve access and to enable traffic loads to be more evenly spread across Centre City.

Maintain Transportation System Performance

The CCTAP recommendations include provisions for additional capacity where necessary for both highway and transit, and through measures such as the revised Preferred Street System, establishment of a Preferred Bus System, and street improvements such as extensions to Imperial, Front/First and B Streets, improve circulation flow so that the maximum effectiveness is obtained from available capacity, and traffic loads are spread more evenly across Centre City rather than being focused on a few over-congested corridors.

Maintain Visual/Physical Quality

The CCTAP recommendations should not only maintain but also improve the visual and physical quality of the downtown transportation system. The primary contributions to this objective are the pedestrian and bicycle network recommendations and proposed sidewalk and bus waiting area improvements. Furthermore, none of the recommendations include aerial or obtrusive structures.

Realistically Attainable and
Flexible Program

The CCTAP recommendations meet the established goals and objectives, have been developed with on-going interagency coordination, input and review during the study process, and already enjoy a general and broad base of support in Centre City. The financing analysis indicated potential shortfalls in funding, but with the development of a private financing mechanism for at least some of the projects, and a potential re-prioritization of the importance of Centre City with regard to the rest of the metropolitan region, these shortfalls stand a very good chance of being overcome. Flexibility of the plan is ensured by the quantitative tool that will be left with the City of San Diego that will allow ongoing monitoring, review of alternative strategies or new ideas in response to changing development conditions, and sensitivity analyses of any potential changes to the action program.

Implementable Plan with Participation and
Support by Public and Private Sector

Centre City public agencies and private sector institutions provided excellent cooperation and support throughout the study. This should provide a sound base for the extensive cooperation that will be necessary between these bodies to ensure a supported and implemented plan. The CCTAP offers suggestions for CCTAP implementation procedures, and the recommendation for a centralized Transportation Systems Management office to coordinate rideshare and transit incentive programs will also be able to play a key role in securing private sector support for the plan.

APPENDIX A

DEFINITION OF HIGHWAY CAPACITIES

CENTRE CITY TRANSPORTATION ACTION PROGRAM

HIGHWAY CAPACITY ASSUMPTIONS

For the Task 4 (Land Use Alternatives) and Task 5 (Transportation Alternatives) analysis, evening peak hour traffic conditions will be evaluated on a volume/capacity basis using the highway capacity assumptions described below. Note that the capacities defined below are for level of service E.

A. CENTRE CITY STREET SYSTEM

Table 1 summarizes the hourly (base) capacity of the various street types in Centre City. Streets are divided first into directional type & number of lanes, then further categorized by the typical proportion of green time available.

Vehicles Per Hour of Green

The following "saturation" flows are assumed, based on highway capacity literature and local observations in Centre City:

Lane/Approach Type	Vehicles Per Hour of Green	
	1-Way Street	2-Way Street
Centre Lane	1,700	1,500
Curb Lane	1,500	1,500
1L Approach	NA	1,500
2L Approach	3,200	3,000
3L Approach	4,700	4,500

The approach figures are then factored by percent green time to obtain base approach capacities, according to the following categories:

Street Type	% Green Time 1-Way Street	2-Way Street
Major	50%	50%
Minor	40%	30%
High Green	60% (1)	65% (2)

(1) Cordon locations only.
(2) Market Street only.

The percent green time figures are averages of current Centre City signal settings.

Applying the percent green time to the vehicles per hour of green figure yields the base hourly approach capacities summarized in Table 1. In certain cases, two further adjustments to capacities are necessary - for transit and for pedestrians.

TABLE 1. BASE HOURLY APPROACH CAPACITY BY STREET TYPE

Road Type	Base Hourly Approach Capacity (Vehicles) Major Street	Minor Street	High Green Street
1-way			
2L	1,600	1,300	NA
3L	2,350	1,900	2,800
2-way			
2L	NA	450	NA
4L	1,500	NA	1,950
6L	2,250	NA	NA

NA = Not applicable.

Source: Vehicles per hour of green X percent green time.

Adjustment for Transit

Based upon information in the Highway Capacity Manual, and draft materials on the new Manual to be published early in 1985, the following adjustment factors were derived for the effect of buses on capacity:

Buses/Hours	Approach Adjustment
0-19	1.00
20-39	0.95
40-59	0.90
60+	0.75

Note that these factors are for the entire approach and are less than the initial factor applied to the curb lane capacity. These factors will be used where appropriate for street segments carrying bus service.

Pedestrian Adjustment Factor

In certain cases, the conflict between turning traffic and pedestrians crossing the cross-street reduces the capacity of a curb lane. The old HCM has no methodology for handling pedestrians. The new HCM has a method based upon the proportion of turning traffic and the volume of pedestrian traffic.

For a typically "high-conflict" situation, where about 50 percent of traffic in the curb lane turns, and there is a volume of 1,000 pedestrians/hours, the capacity of the curb lane is reduced by about one-third (factor of 0.67). This translates into a reduction factor for an overall approach of about 0.85.

For the purposes of alternatives analysis, the following capacity reduction factors will be applied by geographic area:

Area	Approach Adjustment
Central (1)	0.85
Mid (2)	0.95
Outer (3)	1.00

(1) Central Area defined as follows:
Existing/Level 1 - First to Sixth, A to E
Level 2/Level 3 - Kettner to Eighth, Ash to Market

(2) Mid Area defined as follows:
Existing/Level 1 - Kettner to Eighth, Ash to Market, but excluding Central Area
Level 2/Level 3 - Beech to Harbor, Eighth to Harbor

(3) Outer Area defined as remainder of Centre City.

B. FREEWAY SYSTEM

Capacities of the various elements of the freeway system were defined following discussion with Caltrans. The following capacities were assumed for the Task 4 analysis.

	Vehicles/ Hour
Freeway Lane	1800
1-L Ramp	1500
2-L Ramp	2800

APPENDIX B

FUTURE LAND USE SCENARIOS

CENTRE CITY
Transportation Action Program

Figure B-1
Database Block Number System

PRC Engineering, Inc.

TABLE B-1. LEVEL 1 LAND USE SCENARIO

Type (Units)	Project Name	Block No.	Units
OFFICE: (GSF)		32	14,000
		44	74,000
		61	15,000
		68	172,000
		69	183,000
		98	25,000
		109	42,000
		133	62,000
		138	571,400
		143	33,000
	Harbor Square	22	300,000
	Santa Fe (No. 1)	108	500,000
	Horton Plaza	181	350,000
	U.S. Navy	191	1,143,355
	Subtotal Additional		3,484,755
	Existing		7,733,900
	TOTAL		11,218,655
HOTEL: (rooms)	Pelan	98	124
	U.S. Grant	154	250
	Santa Fe (No. 1)	108	600
	Harbor Square	22	300
	Inter (No. 2)	281	700
	Hyatt	280	800
	Lane Field	107	900
	Horton	181	450
	Subtotal Additional		4,124
	Existing		2,674
	TOTAL		6,798
RETAIL: (GSF)	Horton	181	800,000
	Harbor Square	22	100,000
	McClintock	109	16,000
	Columbia	112	83,000
	Meridian	224	20,000
	B Street Pier	105	50,000
	G Street Mole	229	25,000
	Police HQ	277	100,000
		145	30,000
	Station B	189	50,000
	Subtotal Additional		1,274,000
	Existing		3,536,800
	TOTAL		4,810,800
GOVERNMENT: (GSF)	State	96	133,000
	County	114	250,000
	City	115	206,000
	Port	107	65,000
	Police HQ	170	144,000
	Subtotal Additional		798,000
	Existing[1]		3,423,900
	TOTAL		4,221,900
INDUSTRIAL: (GSF)	No Change Existing		4,501,500
EDUCATIONAL: (students)	City College	128	2,000
	Existing		8,301
	TOTAL		10,301
RESIDENTIAL: (D.U.'s)	Horton[2]	181	150
	Marina[2]		1,900
	Subtotal Additional		2,050
	Existing		4,153
	TOTAL		6,203
OTHER: (GSF)	Convention Center	282	500,000
	Existing		2,516,900
	TOTAL		3,016,900

1) Includes cultural/institutional
2) 100 D.U.'s each in blocks 227, 231, 234, 235, 236, 237, 238, 239, 240, 271, 272, 273, 274, 285, 286, 287, 288, 317, 318.

TABLE B-2. LEVEL 2 LAND USE SCENARIO

Type (Units)	Project Name	Block No.	Units
OFFICE:	Level 1		11,218,655
(GSF)	Santa Fe	108	2,500,000
	U.S. Navy	191	489,535
		37	100,000
		64	100,000
		65	100,000
		79	200,000
		92	500,000
		111	350,000
		122	350,000
		123	800,000
		134	350,000
		139	350,000
		140	250,000
		146	350,000
		157	250,000
	TOTAL		18,258,190
HOTEL:	Level 1		6,798
(rooms)	Santa Fe	108	900
		230	2,000
		276	1,000
		317	2,000
	TOTAL		12,698
RETAIL:	Level 1		4,810,800
(GSF)	Santa Fe	108	200,000
	TOTAL		5,010,800
GOVERNMENT:	No Change		
(GSF)	Level 1		4,221,900
INDUSTRIAL:	Level 1		4,501,400
(GSF)	South College[1)]		506,000
	TOTAL		5,007,500
EDUCATIONAL:	Level 1		10,301
(Students)	City College		2,000
	TOTAL		12,301
RESIDENTIAL:	Level 1		6,203
(D.U.'s)		47	400
		50	100
		164	450
		166	100
		208	100
		209	100
	TOTAL		7,453
OTHER:	Level 1		3,016,900
(GSF)	Convention Center No. 2	282	150,000
	TOTAL		3,166,900

1) 23,000 GSF each in following blocks: 210, 211, 213, 215, 216, 217, 248, 250, 251, 252, 267, 295, 297, 298, 300, 301, 304, 306, 307, 332, 337, 349.

TABLE B-3. LEVEL 3 LAND USE SCENARIO

Type (Units)	Project Name	Block No.	Units
OFFICE:	Level 1		11,218,655
(GSF)	Santa Fe	108	1,500,000
	U.S. Navy	191	489,535
		79	200,000
		92	500,000
		122	350,000
		123	600,000
		134	350,000
		139	350,000
		140	250,000
		157	250,000
	TOTAL		16,058,190
HOTEL:	Level 1		6,798
(Rooms)	Santa Fe	108	900
	TOTAL		7,698
RETAIL:	Level 1		4,810,800
(GSF)	Santa Fe	108	39,000
	TOTAL		4,849,800
GOVERNMENT:	No Change		
(GSF)	Level 2		4,221,900
INDUSTRIAL:	No Change		
(GSF)	Level 2		5,007,500
EDUCATIONAL:	No Change		
(Students)	Level 2		12,301
RESIDENTIAL:	Level 2		7,453
(D.U.'s)	Marina (Addition)[1]		1,100
	Columbia	110	600
	TOTAL		9,153
OTHER:	No Change		
(GSF)	Level 2		3,166,900

[1] Blocks 228-230 have D.U.'s, total; Blocks 276 and 277 have 200 D.U.'s each.

APPENDIX C

VOLUME/CAPACITY ANALYSIS FOR FUTURE LAND USE SCENARIOS

TABLE C-1. ON-RAMP PM PEAK-HOUR VOLUME/CAPACITY ANALYSIS

Ramp	Capacity	Level 1			Level 2			Level 3		
		ADT	PM Peak-Hour	V/C	ADT	PM Peak-Hour	V/C	ADT	PM Peak-Hour	V/C
I-5 NB at Hawthorne	1,500	10,060	1,410	0.94	10,460	1,460	0.97	10,530	1,470	0.98
I-5 SB at First	1,500	9,410	1,320	0.88	11,150	1,560	1.04	11,220	1,570	1.05
I-5 NB at Elm	1,500	21,620	3,030	2.02	28,590	4,000	2.67	26,700	3,740	2.49
I-5 SB at Fifth	1,500	7,270	1,020	0.68	11,970	1,680	1.12	11,160	1,560	1.04
SR 163 NB at Eleventh	1,800	14,750	2,065	1.15	18,250	2,555	1.42	17,700	2,480	1.38
I-5 NB at Eleventh	1,500	5,400	760	0.51	6,100	850	0.57	5,950	830	0.55
I-5 SB at "C"	1,500	5,380	750	0.50	6,370	890	0.59	6,220	870	0.58
I-5 SB at "E"	1,500	6,770	950	0.63	6,070	850	0.57	6,280	880	0.59
I-5 SB at "J"	1,500	6,210	870	0.58	6,940	970	0.65	6,390	890	0.59
I-5 NB at "K"	1,500	7,070	990	0.66	7,860	1,100	0.73	7,830	1,100	0.73
SR 94 EB at "G"	2,800	16,290	2,280	0.81	21,570	3,020	1.08	20,920	2,930	1.05

TABLE C-2. PM PEAK-HOUR VOLUME/CAPACITY ANALYSIS FOR SCREENLINES

Location	Directional Capacity		Level 1		Level 2		Level 3	
	Level 1	Level 2, 3	Volume*	V/C	Volume*	V/C	Volume*	V/C
SCREENLINE A: NORTH-SOUTH MOVEMENT, NORTH OF BEECH:								
Harbor	1,500	1,500	1,361	.91	1,705	1.14	1,545	1.03
Pacific	2,138	2,138	1,234	.58	1,907	.89	1,742	.81
Kettner	1,900	1,900	350	.18	467	.25	386	.20
India	1,900	1,900	632	.33	1,273	.67	1,070	.56
Columbia	1,900	1,900	260	.14	620	.33	384	.20
State	1,900	1,900	699	.37	1,940	1.02	1,419	.75
Front	2,350	1,900	1,253	.66	1,594	.84	1,463	.77
First	2,800	2,800	2,476	.88	2,851	1.01	2,749	.98
Second	900	900	515	.69	810	1.08	678	.91
Third	1,900	1,900	1,209	.64	2,394	1.26	2,108	1.11
Fourth	2,350	2,350	992	.42	1,211	.52	1,316	.56
Fifth	2,350	2,350	2,299	.98	2,346	1.00	2,350	1.00
Sixth	2,350	2,350	1,165	.50	1,636	.70	1,412	.60
Park	900	900	826	.92	865	.96	847	.94
SCREENLINE B: NORTH-SOUTH MOVEMENT, NORTH OF "C":								
Harbor	1,500	1,425	738	.49	950	.67	795	.56
Pacific	2,138	2,032	1,147	.54	1,493	.73	1,402	.69
Kettner	900	765	210	.23	694	.91	531	.69
India	1,805	1,615	66	.04	426	.26	244	.15
Columbia	1,805	1,615	270	.15	769	.48	540	.33
State	1,805	1,615	527	.29	544	.34	513	.32
Union	428	383	103	.24	129	.34	135	.35
Front	2,233	1,998	1,666	.75	1,666	.83	1,627	.81
First	1,998	1,998	1,539	.77	2,010	1.01	1,764	.88
Third	383	383	188	.49	216	.56	200	.52
Fourth	1,360	1,360	1,003	.74	981	.72	1,052	.77
Fifth	1,998	1,998	1,297	.65	1,296	.65	1,199	.60
Sixth	1,998	1,998	1,166	.58	1,307	.65	1,251	.63
Seventh	1,805	1,615	407	.23	343	.21	438	.27
Eighth	1,900	1,900	788	.41	858	.45	800	.42
Ninth	1,900	1,900	274	.14	388	.20	363	.19
Tenth	2,233	2,233	1,136	.51	1,333	.60	1,288	.58
Eleventh	2,233	2,233	1,590	.71	1,811	.81	1,692	.76
Twelfth	1,500	1,500	461	.31	421	.28	399	.27
Sixteenth	900	900	305	.34	256	.28	239	.27

(Continued)

TABLE C-2. PM PEAK-HOUR VOLUME/CAPACITY ANALYSIS FOR SCREENLINES (continued)

Location	Directional Capacity		Level 1		Level 2		Level 3	
	Level 1	Level 2, 3	Volume*	V/C	Volume*	V/C	Volume*	V/C
SCREENLINE C: NORTH-SOUTH MOVEMENT, NORTH OF "F":								
Harbor	450	428	685	1.52	880	2.06	810	1.89
Pacific	2,250	2,138	680	.30	875	.41	805	.38
Kettner	450	383	264	.59	277	.72	255	.67
State	428	383	227	.53	316	.83	296	.77
Union	428	383	119	.28	110	.29	107	.28
Front	1,805	1,615	1,145	.63	1,082	.67	1,103	.68
First	1,235	1,105	1,142	.92	1,039	.94	1,041	.94
Fourth	1,805	1,615	477	.26	720	.45	853	.53
Fifth	1,235	1,105	1,412	1.14	1,748	1.58	1,576	1.43
Sixth	1,805	1,615	796	.44	998	.62	872	.54
Seventh	1,805	1,615	272	.15	253	.16	279	.17
Eighth	1,900	1,900	400	.21	401	.21	398	.21
Ninth	1,900	1,900	234	.12	294	.15	294	.15
Tenth	2,350	2,350	663	.28	862	.37	742	.32
Eleventh	2,350	2,350	809	.34	1,122	.48	940	.40
Twelefth	750	750	125	.17	114	.15	116	.15
Thirteenth	1,900	1,900	95	.05	108	.06	93	.05
Fourteenth	1,900	1,900	146	.08	137	.07	132	.07
Sixteenth	900	900	542	.60	412	.46	424	.47
SCREENLINE D: NORTH-SOUTH MOVEMENT, NORTH OF HARBOR:								
Pacific	1,500	1,425	477	.32	707	.50	617	.43
Kettner	900	765	393	.44	414	.54	448	.59
Fifth	450	428	416	.92	582	1.36	514	1.20
Eighth	900	900	291	.32	271	.30	204	.23
SCREENLINE E: EAST-WEST MOVEMENT, EAST OF PACIFIC:								
Beech	450	428	124	.28	163	.38	156	.36
Ash	1,500	1,425	937	.62	1,240	.87	1,208	.85
Broadway	1,350	1,283	983	.73	1,461	1.14	1,203	.94
"G"	900	855	74	.08	365	.43	224	.26
Market	1,950	1,853	567	.29	595	.32	541	.29
Harbor	1,500	1,425	595	.40	833	.58	742	.52

(Continued)

TABLE C-2. PM PEAK-HOUR VOLUME/CAPACITY ANALYSIS FOR SCREENLINES (continued)

Location	Directional Capacity		Level 1		Level 2		Level 3	
	Level 1	Level 2, 3	Volume*	V/C	Volume*	V/C	Volume*	V/C
SCREENLINE F: EAST-WEST MOVEMENT, WEST OF FIRST:								
Beech	450	428	362	.81	466	1.09	402	.94
Ash	2,233	1,998	1,446	.65	1,922	.96	1,761	.88
"A"	2,660	2,380	2,226	.84	2,257	.95	2,153	.90
"B"	428	383	188	.44	345	.90	211	.55
"C"	1,805	1,615	302	.17	639	.40	476	.29
Broadway	1,069	957	1,109	1.04	1,583	1.66	1,538	1.60
"F"	428	383	353	.82	360	.94	343	.90
"G"	428	383	380	.89	614	1.60	499	1.30
Market	1,950	1,658	967	.50	1,250	.75	1,092	.66
Harbor	1,500	1,425	855	.57	1,181	.83	1,089	.76
SCREENLINE G: EAST-WEST MOVEMENT, WEST OF FIFTH:								
Cedar	1,300	1,300	969	.75	1,234	.95	1,092	.84
Beech	450	428	91	.20	437	1.02	304	.71
Ash	2,233	1,998	1,185	.53	1,712	.86	1,600	.80
"A"	2,660	2,380	1,625	.61	1,970	.83	1,885	.79
"B"	1,998	1,998	1,062	.53	1,284	.64	1,167	.58
"C"	1,615	1,615	307	.19	579	.36	485	.30
Broadway	957	957	1,236	1.29	1,516	1.58	1,328	1.39
"E"	1,615	1,615	925	.57	823	.51	900	.56
"F"	1,520	1,360	1,287	.85	1,283	.94	1,134	.83
"G"	2,233	1,998	1,576	.71	1,837	.92	1,944	.97
Market	1,950	1,658	1,110	.57	1,314	.79	1,187	.72
"J"	450	428	217	.48	397	.93	279	.65
Harbor	1,500	1,425	1,105	.74	1,456	1.02	1,347	.95
SCREENLINE H: EAST-WEST MOVEMENT, EAST OF FOURTEENTH:								
"B"	2,350	2,350	808	.34	981	.42	993	.42
"C"	1,900	1,900	1,700	.89	2,056	1.08	1,865	.98
Broadway	1,950	1,950	825	.42	1,134	.58	938	.48
"E"	1,950	1,950	291	.15	290	.15	303	.16
"F"	2,800	2,800	1,514	.54	1,689	.60	1,578	.56
"G"	2,800	2,800	1,456	.52	2,240	.80	2,156	.77
Market	1,950	1,950	1,219	.63	1,371	.70	1,294	.66
"J"	450	450	103	.23	245	.54	147	.33
Imperial	450	450	376	.84	477	1.06	431	.96

*For a two-way street, represents highest directional volume.

APPENDIX D

VOLUME/CAPACITY ANALYSIS FOR ALTERNATIVE TRANSPORTATION PACKAGES

TABLE D-1. SCREENLINE COMPARISON OF P.M. PEAK-HOUR VOLUMES AND CAPACITIES*

Screenline/ Location	Level 2			Package I			Package II			Package III			Package IV		
	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vc	Cap.	V/C	Vol.	Cap.	V/C
North-South Movement, North of Beech:															
Harbor	1,700	1,500	1.14	2,000	2,250	.89	1,600	1,500	1.06	1,550	1,500	1.03	1,750	1,500	1.17
Pacific	1,900	2,150	.89	1,750	2,150	.82	1,800	2,150	.84	1,650	2,150	.77	1,850	2,150	.87
Kettner	450	1,900	.24	400	1,900	.21	400	1,900	.21	450	1,900	.24	400	1,900	.21
India	1,250	1,900	.66	1,250	1,900	.66	1,200	1,900	.63	1,400	1,900	.74	1,450	1,900	.76
Front	1,600	1,900	.84	1,600	3,200	.50	1,500	1,900	.79	1,400	3,200	.44	1,600	3,200	.50
First	2,850	2,800	1.01	3,200	3,850	.83	2,700	2,800	.96	3,450	3,840	.89	3,200	3,840	.83
Fourth	1,200	2,350	.51	1,200	3,200	.37	1,150	2,350	.49	1,450	3,200	.45	1,700	3,200	.53
Fifth	2,350	2,350	1.00	2,250	3,200	.70	2,250	2,350	.96	1,950	3,200	.61	2,250	3,200	.70
Sixth	1,650	2,350	.70	1,600	3,200	.50	1,550	2,350	.66	2,300	1,500	1.53	1,350	3,200	.42
Park	850	900	.94	850	900	.94	800	900	.89	800	900	.89	850	900	.94
	15,800	20,100	.79	16,100	25,750	.63	14,950	20,100	.74	16,400	23,300	.70	16,400	25,000	.66
North-South Movement, North of "C":															
Harbor	950	1,450	.67	1,800	2,200	.84	900	1,450	.63	750	1,450	.53	1,050	1,450	.72
Pacific	1,500	2,050	.74	1,050	2,050	.52	1,400	2,050	.69	1,400	2,050	.69	1,550	2,050	.76
Kettner	700	750	.92	350	1,300	.27	650	750	.85	N/A	N/A	N/A	700	1,300	.55
India	400	1,600	.25	650	1,600	.40	400	1,600	.25	500	1,600	.31	300	1,600	.19
Front	1,650	2,000	.83	1,450	2,700	.53	1,550	2,000	.78	1,600	2,700	.59	1,700	2,700	.63
First	2,000	2,000	1.00	1,450	2,700	.53	1,850	2,000	.93	2,000	2,700	.74	1,700	2,700	.63
Fourth	1,000	1,350	.74	650	2,000	.33	900	1,350	.66	2,300	2,700	.85	1,500	2,700	.55
Fifth	1,300	2,000	.65	1,300	2,000	.65	1,200	2,000	.60	N/A	N/A	N/A	1,500	2,000	.75
Sixth	1,300	2,000	.65	1,200	2,700	.44	1,250	2,000	.63	1,750	2,700	.64	800	2,700	.29
Tenth	1,350	2,250	.60	1,500	3,050	.49	1,250	2,250	.56	1,950	3,050	.64	1,450	3,050	.48
Eleventh	1,800	2,250	.81	1,650	3,050	.54	1,700	2,250	.76	1,850	3,050	.61	1,750	3,050	.58
	13,950	19,700	.71	13,050	25,350	.51	13,050	19,700	.66	13,350	22,000	.61	14,000	25,300	.55
North-South Movement, North of Harbor Drive:															
Pacific	700	1,450	.49	1,050	2,150	.49	650	1,450	.46	1,300	2,150	.61	1,250	2,150	.58
Kettner	400	750	.52	350	750	.46	400	750	.52	100	750	.12	400	750	.52
Front	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	900	3,200	.28
First	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,300	3,200	.41
Fifth	500	450	1.40	600	1,450	.42	550	450	1.28	300	450	.70	100	450	.23
Eighth	250	900	.28	200	900	.22	250	900	.28	550	900	.61	450	900	.50
	1,950	3,500	.55	2,200	5,250	.42	1,850	3,550	.52	2,250	4,250	.53	4,400	10,650	.41

(Continued . . .)

TABLE D-1. SCREENLINE COMPARISON OF P.M. PEAK-HOUR VOLUMES AND CAPACITIES* (Continued)

Screenline/ Location	Level 2			Package I			Package II			Package III			Package IV		
	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C
East-West Movement, East of Pacific:															
Ash	1,250	1,450	.88	1,150	1,450	.81	1,150	1,450	.81	1,300	1,400	.91	1,350	1,450	.95
Broadway	1,450	1,300	1.13	2,200	1,900	1.15	1,350	1,300	1.05	400	1,300	.31	1,250	1,300	.98
"G"	350	850	.41	50	850	.06	350	850	.41	350	850	.41	350	3,050	.12
Market	600	850	.70	350	1,850	.19	550	850	.64	550	1,900	.30	400	2,800	.14
Harbor	850	1,450	.60	1,150	1,425	.81	800	1,450	.56	1,450	1,400	1.02	1,400	2,150	.65
	4,500	5,900	.77	4,900	7,500	.65	4,200	5,900	.72	4,050	6,850	.59	4,750	10,750	.44
East-West Movement, West of First:															
Ash	1,900	2,000	.95	1,800	2,700	.66	1,800	2,000	.90	1,950	2,700	.72	1,650	2,700	.61
"A"	2,250	2,300	.95	3,550	3,250	1.09	2,100	2,400	.88	3,300	3,250	1.01	3,150	3,250	.97
"B"	350	400	.91	200	400	.52	300	400	.78	350	400	.91	1,000	2,700	.38
Broadway	1,600	950	1.67	1,800	1,450	1.26	1,450	950	1.51	750	950	.78	1,000	950	1.04
"G"	600	400	1.58	700	400	1.84	550	400	1.45	500	400	1.32	1,450	2,700	.53
Market	1,250	1,650	.75	1,200	1,650	.72	1,150	1,650	.69	1,300	1,650	.78	1,550	2,500	.62
Harbor	1,200	1,450	.84	1,500	1,450	1.05	1,100	1,450	.77	1,300	1,450	.91	2,600	2,150	1.22
	9,150	9,150	1.00	10,750	11,300	.95	8,450	9,250	.91	9,450	10,800	.88	12,400	16,950	.73
East-West Movement, West of Fifth:															
Ash	1,700	2,000	.85	1,600	2,700	.59	1,600	2,000	.80	2,250	2,700	.83	1,750	2,700	.64
"A"	2,000	2,400	.84	2,300	3,250	.70	1,850	2,400	.78	2,550	3,250	.78	1,850	3,250	.57
"B"	1,300	1,300	.65	1,900	2,000	.95	1,200	2,000	.60	1,450	2,000	.73	2,100	2,700	.77
Broadway	1,500	950	1.56	1,300	950	1.35	1,400	950	1.46	1,150	950	1.20	1,150	950	1.20
"F"	1,300	1,350	.96	1,600	2,000	.80	1,200	1,350	.88	1,250	2,000	.63	450	2,000	.23
"G"	1,850	2,000	.93	1,450	2,700	.53	1,700	2,000	.85	2,050	2,700	.75	2,200	2,700	.81
Market	1,300	1,650	.78	1,550	1,650	.93	1,200	1,650	.72	1,300	1,650	.78	1,800	2,500	.72
Harbor	1,450	1,450	1.02	1,800	1,450	1.26	1,400	1,450	.98	1,550	1,450	1.09	2,700	2,150	1.26
	12,400	13,100	.90	13,500	16,700	.81	11,550	13,800	.84	13,550	16,700	.81	14,000	18,950	.74

(Continued . . .)

TABLE D-1. SCREENLINE COMPARISON OF P.M. PEAK-HOUR VOLUMES AND CAPACITIES* (Continued)

Screenline/ Location	Level 2			Package I			Package II			Package III			Package IV		
	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C	Vol.	Cap.	V/C
East-West Movement, East of 14th:															
"B"	1,000	2,350	.43	1,100	2,350	.47	950	2,350	.40	1,000	2,350	.43	700	2,350	.30
"C"	2,050	1,900	1.08	2,200	1,900	1.16	1,950	1,900	1.03	2,200	1,900	1.16	1,900	1,900	1.00
Broadway	1,150	1,950	.59	1,100	1,950	.56	1,100	1,950	.56	950	1,950	.49	800	1,950	.41
"E"	300	1,950	.15	200	1,950	.10	300	1,950	.15	100	1,900	.05	200	1,950	.10
"F"	1,700	2,800	.61	1,800	3,850	.47	1,600	2,800	.57	1,600	3,850	.42	1,450	3,850	.38
"G"	2,250	2,800	.80	2,900	3,850	.76	2,150	2,800	.77	2,150	3,850	.56	2,300	3,850	.60
Market	1,350	1,950	.69	1,800	2,950	.62	1,300	1,950	.67	1,250	1,950	.64	1,950	2,950	.67
Imperial	500	450	1.11	750	1,500	.50	450	450	1.00	850	1,500	.57	800	1,500	.53
	10,300	16,150	.64	11,850	20,300	.58	9,800	16,150	.61	10,100	19,250	.52	10,100	20,300	.50

*Volumes on two-way streets represent highest directional volume.

APPENDIX E

CENTRE CITY TRANSPORTATION IMPROVEMENT COST ESTIMATES

TABLE E-1. CENTRE CITY TRANSPORTATION IMPROVEMENT COST ESTIMATES

Action		Project Items	Est. Cost ($) (2)
I. STREET SYSTEM			
A. Revise Perferred Street System			No Cost
B. Reconfigure and restripe major 1-way streets	11th	A to Broadway, & Market to Imperial	37,500
	10th	A to Broadway, & Market to Imperial	42,400
	8th	Broadway to E	3,000
	7th	Market to Ash	176,600
	6th	Cedar to Market	46,700
	5th	Cedar to B	26,500
	4th	Cedar to Market	46,700
	1st	Cedar to Island	52,400
	Front	Date to Island	55,300
	India	Ash to A	3,700
	Kettner	Ash to Beech	3,700
	Hawthorn	Harbor to I-5	27,000
	Grape	Harbor to I-5	28,300
	Ash	Kettner to 10th	50,400
	A	Kettner to 11th	54,100
	B	Kettner to First & Fourth to Eleventh	491,500
	F	Fourth to Seventeenth	53,300
	G	Pacific to I-5	597,200
			$ 1,796,300
C. Reconfigure and restripe major 2-way streets	Market	Nineteenth to Pacific	$ 100,400
	Broadway	Harbor to Pacific	5,900
	Ash	Harbor to Kettner	14,800
			$ 121,100
D. Upgrade to major street configuration	Imperial	Harbor to I-5	$ 903,600

TABLE E-1. CENTRE CITY TRANSPORTATION IMPROVEMENT COST ESTIMATES (Continued)

Action	Project Items			Est. Cost ($) (2)	
I. STREET SYSTEM (Continued)					
E. Street widening (reconstruction)	Laurel	Harbor to Pacific		$ 118,400	
	Harbor	Kettner to Seventh		2,357,600	
				$ 2,476,000	
F. New street construction	Front	Market to First		$ 707,100	
	First	Island to Harbor		951,800	
	B	Through City Concourse		1,517,000	
	Imperial Extension			523,200	
				$ 3,699,100	
G. Widen freeway ramps	I-5	SB-off at Front		$ 3,500,000	
	I-5	NB-on at First		3,100,000	
	I-5	SB-off at Kettner		3,200,000	
				$ 9,800,000	
SUBTOTAL STREET SYSTEM				$ 18,797,000	
II. CENTRE CITY ENTRY CORRIDORS					
A. Centre City freeway signing	I-5 NB and SB Centre City access locations.			$ 2,100,000	
B. Improve freeway capacity	I-5 Auxiliary Lanes(4)	Route 8 to Front/First	$ 520,000 -	28,000,000	(4)
	SR-94 Auxiliary Lanes (4)	Route 5 to Route 15	1,300,000 -	17,500,000	(4)
	SR163 Auxiliary Lanes (3)	Route 5 to Unversity	28,000,000 -	28,000,000	
			$29,820,000 -	73,500,000	(4)
C. Upgrade Pacific Hwy. as major NW entryway	Pacific	Washington to Ramps		$ 353,000	
	Pacific	Washington Barnett		993,000	
		From SB I-5		17,500,000	
		From WB I-8		8,400,000	
				$ 27,246,000	
SUBTOTAL CENTRE CITY ENTRY CORRIDORS				$ 59,166,000- $102,846,000	

TABLE E-1. CENTRE CITY TRANSPORTATION IMPROVEMENT COST ESTIMATES (Continued)

Action	Project Items			Est. Cost ($) (2)
III. TRANSIT				
A. Establish Broadway/"E" as major bus streets	Includes contra-flow bus lanes on "E" St.			$ 452,000
B. Establish Fifth/Sixth Aves. as major bus streets	Includes bus lane on Sixth Ave.			37,000
C. Establish Columbia/State as major bus streets	Columbia	Ash to Broadway		947,300
	State	Ash to Broadway		947,300
				$ 1,894,600
D. Focus transit transfers	Includes bus shelters and informational displays.			97,000
SUBTOTAL TRANSIT				$ 2,481,000

TABLE E-1. CENTRE CITY TRANSPORTATION IMPROVEMENT COST ESTIMATES (Continued)

Action	Project Items	Est. Cost ($) (2)
IV. OTHER MODES		
A. Establish pedestrian route system in Centre City	Includes signing and installation of specially-surfaced pedestrian walkways.	$ 6,299,000
B. Establish centralized TSM/rideshare office	Areawide, but with particular focus on core area.	3,500,000 (5)
SUBTOTAL OTHER MODES		$ 9,799,000
GRAND TOTAL		$ 90,243,000-
		$133,923,000

(1) See also Table 25 for description of improvement.

(2) In current dollars.

(3) Widening of SR 163 and Centre City ramps includes right-of-way acquistion and same is reflected in costs.

(4) The higher figure, as regards addition of auxiliary lanes for I-5 and SR-94, assesses the complete reconstruction to achieve a permanent and "standard" freeway cross-section. The much lower cost provides for no reconstruction, would require use of existing shoulders, re-striping and re-dotting, and would yield a substandard cross-section.

(5) Over a 20-year period.

PRC Engineering Consultant Team

Michael Bates (Project Manager)

Howard Smith

Philip Walling

Tom Jenkins

Doug Keys

Eric Dong

David Kuan

Tom Gaul

John Long